

The World Bank Financed

**Shangli Water Environment Management
Project
Environmental Management Plan**

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1. Overview

1.1. Introduction

Based on “the World Bank Financed Shangli Water Environment Management Project—Environmental Assessment Report”, this environmental management plan (EMP) is an independent document that includes all environmental protection actions during the project design, construction and operation periods, and which acts as an action principle and working framework for implementation of mitigation measures, environmental management and environmental monitoring. The main contents of the plan include:

- *Project introduction
- *Potential environmental impacts
- *Agencies and responsibilities
- *Environmental Management Plan
- * Environmental monitoring plan
- * Environmental supervision

1.2. EMP Objectives

The objectives of EMP preparation are to 1) improve project screening, site selection, planning, design, implementation and other activities through practicable and feasible prevention and mitigation measures or measures to offset adverse environmental impacts and enhance positive environmental impacts, i.e. to take measures during project implementation to mitigate and manage adverse environmental impacts,; 2) assess the actual effectiveness of mitigation measures through implementing environmental monitoring plan, propose, based on monitoring results, recommendations for further improving mitigation measures and meet relevant environmental requirements of the state, Jiangxi Province and the World Bank.

2. Project Description

2.1. Project Background

To reduce the pollutants that are discharged from key waters to Poyang Lake and improve the management of water quality of Shangli County, Shangli County plans to use the World Bank Financed Shangli Water Environment Management Project to treat domestic garbage in an effective and stable way, mitigate pollution to the Poyang Lake from the source, enhance the solid garbage management level and achieve urbanization of sustainable development.

2.2. Project Components

As shown in Table 2-1, the project consists of waste collection and transportation and other non-engineering measures.

Table 2-1 Project Components

Project name	Sub-project	Content	Type	location	Services coverage
Main project	waste transfer stations	build 6 waste transfer stations	new	build one station in each of the six towns and townships, including Yangqi Township, Changping Township, Futian Town, Penggao Town, Dongyuan Township, Chishang Town.	treat domestic garbage of Changping Township, Futian Town, Penggao Town, Dongyuan Township, Chishang Town, Yangqi Township.
	waste collection stations	build 87 waste collection stations	new	build a waste collection station in each village of each Town.	
Other project	Water environment monitoring premises	Utilize the existing houses of Shangli EPB to set up water environment monitoring and dispatching system premises			
Investment	About RMB 191,474,500 in total, including USD 20 million (RMB 132 million, 1 USD = 6.6 RMB) loan of World Bank and RMB 59,474,500 of counterpart funding from superior support and the local government's self-raised fund.				

Table 2-2 Construction Scale of Waste Transfer Station

Project	Number							Unit
	Changping Township	Futian Town	Penggao Town	Dongyuan Township	Chishang Town	Yangi Township	Sum	
Compression type	14	7	6	8	11	14	60	vehicle

garbage truck (small size)								
Compression type garbage truck (large size)	6	4	4	8	8	3	33	vehicle
Garbage collection station	19	10	9	15	18	16	87	set
Garbage transfer station	1	1	1	1	1	1	6	set
Garbage transfer vehicle	1	1	1	1	1	1	6	vehicle
Suction-type sewer scavenger	1	1	1	1	1	1	6	vehicle
Street sanitizer	1	1	1	1	1	1	6	vehicle
Cleaning vehicle	1	1	1	1	1	1	6	vehicle
New pavement	20000	10000	8000	18000	20000	10000	86000	m ²
Repaired pavement	8500	4200	4000	8000	9000	4300	38000	m ²
Display platform of environmental sanitation system	1	1	1	1	1	1	6	set
Intelligent cloud platform of garbage collection and transfer treatment system	one set (covering 10 townships and towns of the county)							

Table 2-3 Construction Scale of Waste Transfer Station

No.	Town	Location	Daily average garbage transfer volume (t/d)	Construction scale of waste transfer station (t/d)	Construction area (m ²)	Floor space (m ²)
1	Changping Township	Muchong Village	28.7	43.5	207.5	999
2	Futian Town	Minshan Village	16.8	25.2	207.5	999
3	Penggao Town	Taitang Village	14.4	21.6	207.5	999
4	Dongyuan Township	Guanshang	28.0	42	207.5	999

	p					
5	Chishan Town	Penggao Village	31.5	47.3	207.5	999
6	Yangqi Township	Dongyuan Village	19.3	29.0	207.5	999
7	Total		125.8	138.7	1245	5994

3. Environmental Protection Targets and Standards

3.1. Environmental Protection Targets

According to the on-site survey by the project team, villages involved in garbage transfer station are shown in Table 3-1

Table 3-1 List of Villages Involved in Garbage Transfer Station

Project content	Involved villages	Location	Distance from the project (m)	Number of household
Garbage transfer station	Muchong Village	On the Western side of Chishan Township garbage transfer station	2000	10 households
	Minshan Village	On the Western side of Futian Township garbage transfer station	1000	3 households
	Taitang Village	On the northern side of Changping Township garbage transfer station	400	12 households
	Guanshang	On the northern side of Yangqi Township garbage transfer station	200	5 households
	Penggao Village	On the northern side of Penggao Township garbage transfer station	1000	8 households
	Dongyuan Village	On the Western side of Dongyuan Township garbage transfer station	1000	3 households

The above table indicates that transfer stations are far away from residential zones, without sensitive spots like residential zone, hospital and school within 200m range. Therefore, there are no acoustic and ambient air protection targets for garbage transfer stations.

Table 3-2 List of Water Environment Protection Targets

No.	Protection target	Water quality target	Water body function
1	Lishui River	Category III	scenic and recreational purposes

Table 3-3 List of Ecological Environment Protection Targets

No.	Environment factor	Protection target	Overview of the protective target
1	ecological environment	terrestrial plant	lost plants due to permanent and temporary land occupation of the project
		wild animals	wild animals within the range of project impact area

Table 3-4 List of Social Environment Protection Targets

No.	Protection targets	Overview of the protective targets
1	social environment	local economy

3.2. Environmental Protection Standards

3.2.1 Environmental Quality Standards

(1) Ambient air

In accordance with EHS, ambient air quality shall meet national standard stipulated by law. The ambient air involved in the project is classified as Category II, following Category II standard in *Ambient Air Quality Standards* (GB3095-2012). For ambient air quality standards of NH₃ and H₂S, reference can be made to maximum allowable concentration of hazardous substance in the residence zone as stipulated in *Hygienic Standards for the Design of Industrial Enterprises*(TJ36-79). The specific standards are shown in Table3-5 below.

Table 3-5 Ambient Air Quality Standards

Item	1-hour average	24-hour average	Standard
SO ₂	500	150	Category II Standard in <i>Ambient Air Quality Standards</i> (GB3095-2012)
NO ₂	200	80	
TSP	-	300	
PM ₁₀	-	150	
NH ₃	200(one-time monitoring)	-	<i>Hygienic Standards for the Design of Industrial Enterprises</i> (TJ36-79)
H ₂ S	10 (one-time monitoring)	-	

(2) Water Environment

Lishui River involved in this project serves scenic and recreational purposes and is subject to Category III standard in *Surface Water Environment Quality Standards* (GB3838-2002). See Table 3-6 for details.

Table 3-6 Surface Water Environment Quality Standards (mg/L, excluding pH)

Assessment factor	<i>Surface Water Environment Quality Standards</i> (GB3838-2002)
	Category III Standard
pH	6-9
dissolved oxygen	≥5
permanganate index	≤6
COD	≤20
BOD ₅	≤4
TN	≤1.0
NH ₃ -N	≤1.0

TP	≤0.2(for lake and reservoir, 0.05)
petroleum	≤0.05
sulfide	≤0.2
fecal coliform	≤10000
involved Water body	Lishui River

(3)Acoustic environment

See standard limit in national standards concerning acoustic environment quality, and standard of noise in EHS in Table 3-7

Table3-7 Comparison of Acoustic Environment Quality(dB(A))

<i>Acoustic Environment Quality Standards (GB3096-2008)</i>				Standard of noise in EHS		
Implemented area	Category of functional zone	Daytime 6:00~22:00	Nighttime 22:00~6:00	Receptor	Daytime 7:00~22:00	Nighttime 22:00~7:00
Residential, health care, cultural&educational, scientific research design and office area	Category I	55	45	Residential, office, cultural&educational area	55	45

Location of the project is in rural area. Through comparative analysis, the acoustic environment involved in the project is subject to Category I standard in *Acoustic Environment Quality Standards (GB3096-2008)*. See details in Table 3-8.

Table 3-8Acoustic Environment Quality Standards (dB (A))

Item	Category	<i>Acoustic Environment Quality Standards (GB3096-2008)</i>	
		daytime	nighttime
acoustic environment	Category I	55	45

3.2.2 Pollutant Discharge Standards

(1) Atmospheric pollutants

Monitored concentration limits for fugitive discharge in *Comprehensive Atmospheric Pollutant Emission Standards (GB16297-1996)* are applied for dust from construction and dust generated during the operation period of waste transfer stations. See Table 3-9 for details.

Odor generated during the operation period of waste transfer stations is subject to Category II standard for fugitive discharge in *Emission Standards for Odor Pollutants (GB14554-93)*. See Table 3-10 for standard limits.

Table 3-9 Comprehensive Atmospheric Pollutant Emission Standards (excerpt)
(unit: mg/m³)

Pollutant	Monitored concentration limits for fugitive discharge	
particulate matter	Monitoring Point	Concentration
	outside border maximum concentration point	1.0

Table 3-10 Emission Standards for Odor Pollutants (excerpt)(unit: mg/m³)

Pollutant	Standards at industrial enterprises boundary for fugitive discharge (new, improvement or expansion)
NH ₃	1.5
H ₂ S	0.06

(2) Noise

Standards for Ambient Noise Emission at Construction Site Boundary(GB12523-2011) applies for all construction noises. Noise generated during operation period in waste transfer stations is subject to Category II standard in *Emission Standards for Industrial Enterprises Noise at Boundary* (GB12348-2008). See Table 3-11 for details.

Table3-11Standards for Ambient Noise Emission (unit: dB (A))

Item	<i>Emission Standards for Industrial Enterprises Noise at Boundary</i> (GB12348-2008)	<i>Standards for Ambient Noise Emission at Construction Site Boundary</i> (GB12523-2011)
	Category I	Standards for Ambient Noise Emission at Construction Site
daytime	55	70
nighttime	45	55

(4) Solid waste

The treatment of solid waste in this project is subject to *Pollutant Control Standards for Storage and Disposal Sites of General Industrial Solid Waste* (GB18592—2001).

4. Environmental Management Plan

4.1. Environmental Management Agencies and Responsibilities

Setup of the project's environmental management agencies is provided in Table 4-1 and Figure4-1; Roles and responsibilities and staff establishment are provided in Table 4-2.

Table 4-1 Agencies under Environmental Management System

Name	Name	Roles and Responsibilities
Management	PPMO	Designates an environmental manager to be exclusively responsible for environmental protection activities during planning, design and implementation, make sure work procedures meet domestic and World Bank requirements for environmental assessment and environmental management, incorporate EMP into bidding documents and contracts, and coordinate and supervise EMP implementation.
	County PMO	Designates staff to be exclusively responsible for routine environmental supervision and management during project implementation and operation, environmental acceptance and routine monitoring after project completion to reduce adverse environmental impacts of the project to the lowest possible or acceptable levels and maximize environmental benefits of the project; provide funding needed for carrying out environmental protection activities and take charge of sorting out and archiving relevant documentation.
	Project Owner	Designates staff to be exclusively responsible for environmental management during project operation
Supervision	World Bank Supervision Mission	Sends an environmental specialist to supervise and review ECOP implementation
	Various-level Environmental Protection Administrations	Supervise and inspect to ensure work procedures meet Government of China (GOC) requirements for environmental management and pollution control measures during project implementation meet GOC requirements for environmental protection.
Implementation	Civil Works Contractor	Appoints a site environmental engineer to implement environmental protection and soil and water conservation measures specified in contract clauses and the bidding document, prepare and submit monthly environmental reports during construction, following requirements of the World Bank and local environmental protection administrations for environmental protection.
Consulting Services	EIA Institute	Prepares project environmental report.
	Design Institute	Prepares feasibility study and construction design.
	Environmental Supervision Agency	Supervises route construction activities of the contractor.
Monitoring	Environmental Monitoring Agency	Qualified environmental monitoring agency takes charge of environmental monitoring during project construction and operation.

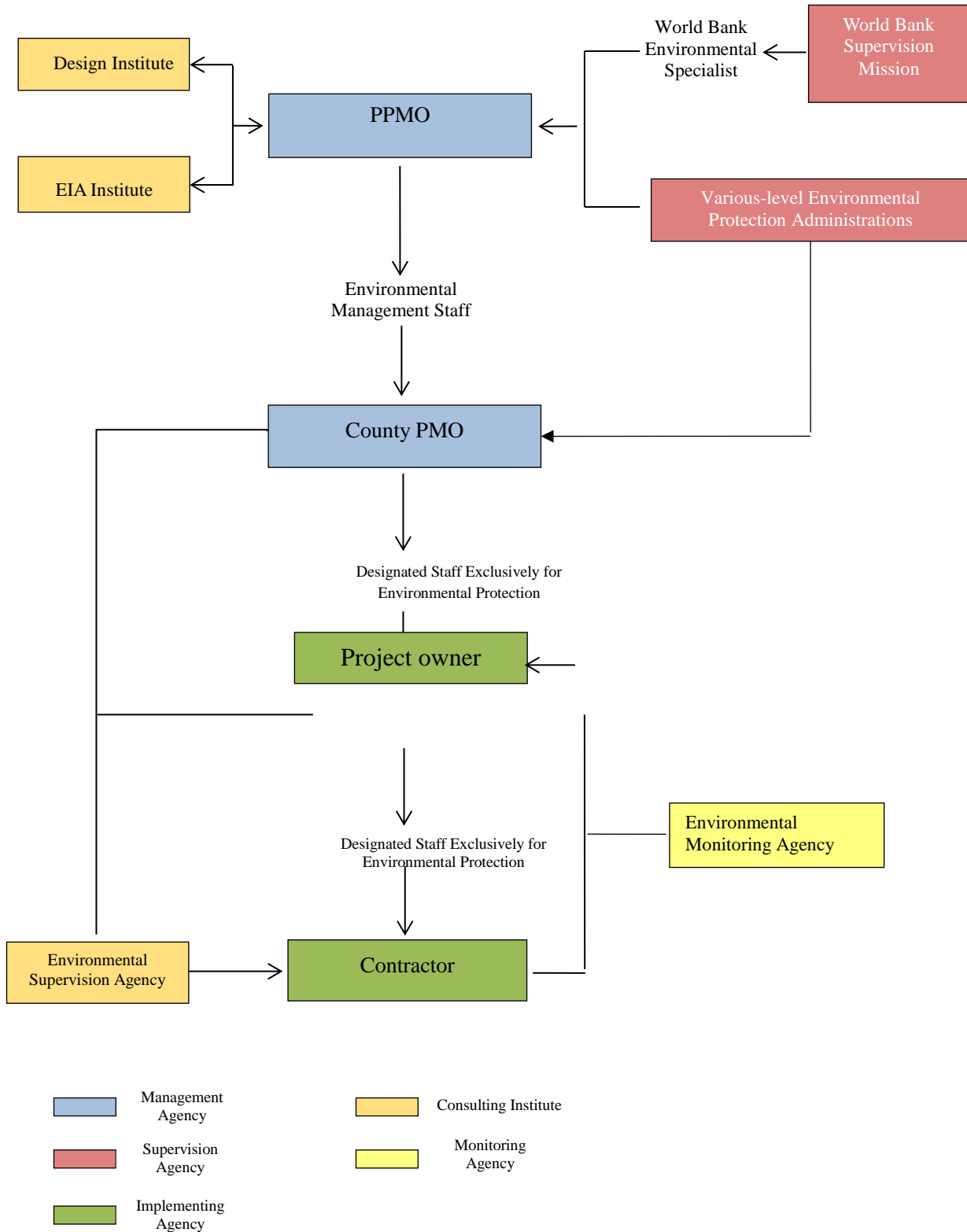


Figure 4-1 Organizational Framework of Environmental Management during Construction Period

Table 4-2 Roles and Responsibilities and Staff Establishment of Agencies under Environmental Management System

Agency	Type	Staff Establishment (No. of People)	Roles and Responsibilities
Various-level Environmental Protection Administrations	Supervision	A few	1. Undertakes whole-process environmental monitoring and management in accordance with law, including approval of Project EIA (or sub-project EIAs), environmental monitoring and management during project implementation and operation.
World Bank	Supervision	1	1. Sends supervision missions every year to supervise project implementation; 2. Reviews implementation of the project's Loan Agreement and EMP.
PPMO	Management	1	1. Supervises EMP implementation; 2. Supervises and coordinates enforcement of domestic and World Bank requirements for environmental management; 3. Submits relevant reports to the World Bank every six months; 4. Inspects environmental protection activities of project counties (cities); 5. Coordinates with other relevant authorities to address significant environmental issues; 6. Engages panel of external environmental specialists to review environmental protection activities.
County PMO	Management	1	1. Supervises implementation of sub-project environmental management rules and institutions; 2. Incorporates environmental protection measures in the EMP into construction contracts; 3. Employs supervision engineer and supervises and coordinates its work (including qualification, responsibilities and management); 4. Organizes EMP implementation; 5. Organizes special-subject study or relevant investigations; 6. Properly documents and compiles complaints during construction and operation, clarifies to the public result of addressing complaints and addresses public complaints; 7. Reviews environmental supervision and environmental consulting reports; 8. Submits quarterly reports (statements) to PPMO; 9. Signs off on site checklists submitted by the contractor and supervision engineer, verifies environmentally sensitive issues and archives the checklists; 10. Receives environmental supervision mission (including World Bank supervision mission).

Project Owner	Management	1	<ol style="list-style-type: none"> 1. Supervises implementation of subproject environmental management rules and institutions; 2. Supervises and coordinates work of supervision engineer (including qualification, responsibilities and management); 3. Organizes special-subject study or relevant investigations; 4. Properly documents and compiles complaints during construction and operation, clarifies to the public result of addressing complaints and addresses public complaints; 5. Reviews environmental supervision and environmental consulting reports; 6. Submits quarterly reports (statements) to PPMO and county PMO; 7. Signs off on site checklists submitted by the contractor and supervision engineer, verifies environmentally sensitive issues and archives the checklists; 8. Receives environmental supervision mission (including World Bank supervision mission).
EIA Institute	IEA	A few	<ol style="list-style-type: none"> 1. Visits project sites and conducts EIA; 2. Prepares EMP.
Environmental Supervision Agency	Consulting	1-2	<ol style="list-style-type: none"> 1. Supervision engineer is employed separately by county PMO; 2. Supervises and inspects domestic sewage treatment, production wastewater treatment, implementation of soil erosion, waste gas, dust and noise control measures, disposal of production and domestic garbage and epidemic control; 3. Fills out on a regular basis all checklists in the annexes of ECOP; 4. Proposes and follows up on solutions to rectify environmental issues/ problems encountered by the contractor during construction, including issuing rectification notices and checklists and archiving relevant documentation; 5. Submits to county PMO weekly implementation progress reports.
Contractor	Implementation	Many	<ol style="list-style-type: none"> 1. Develops environmental protection measures to be implemented during construction; 2. Accepts supervision and inspection of all aspects of environmental protection by supervision engineer, World Bank and various-level environmental protection administrations; 3. Sets up a feedback mechanism and completes rectification within 3 working days after receiving rectification notice (or within 10 working days when addressing of issues/problems needs coordination by management agencies); 4. Prepares, together with supervision engineer, prior to construction commencement and submits to county PMO a construction site

			checklist; 5. Submits to county PMO weekly implementation progress reports.
Environmental Monitoring Agency	Monitoring	A few	1. Undertakes environmental monitoring during implementation and operation following EMP requirements, archives and submits to county PMO monitoring reports.

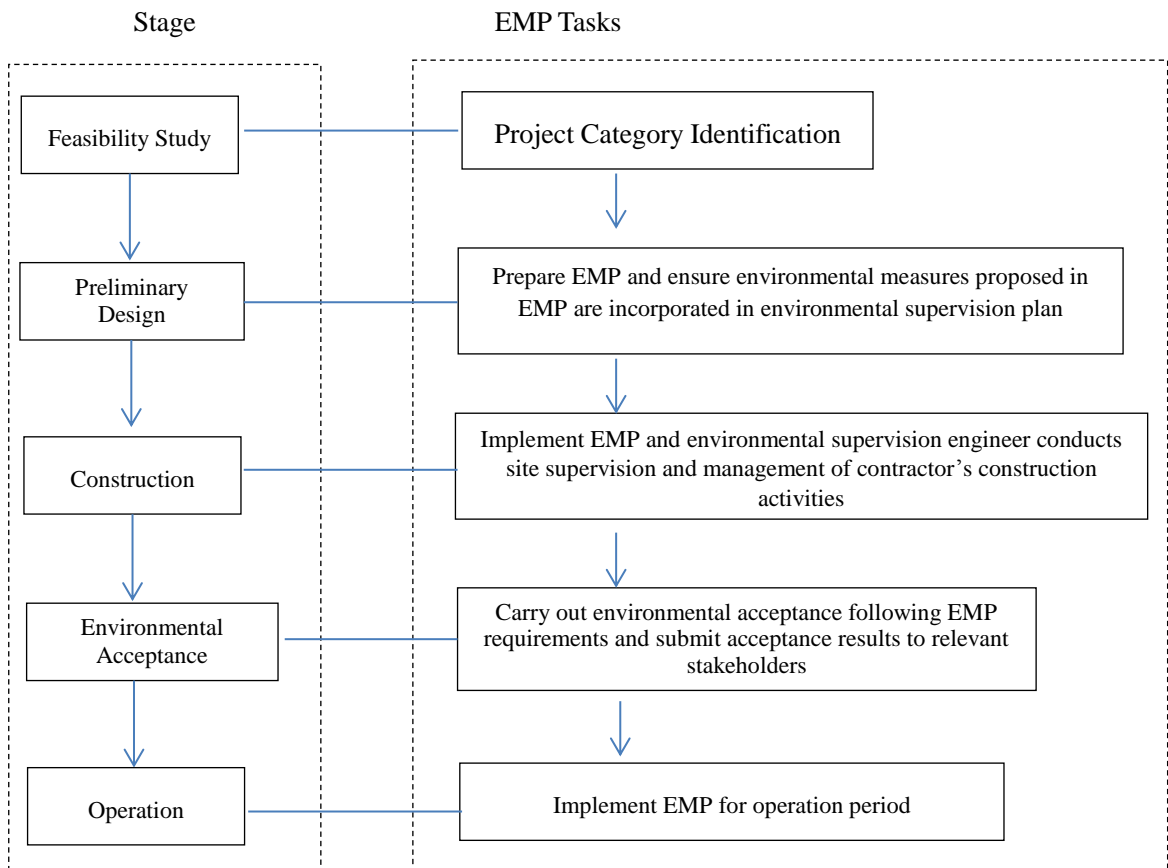
4.2. Environmental Management Tasks at Different Project

Stages

As shown in Figure 4-2, environmental management tasks differ in different stages of project implementation.

The most important task in the EMP is to ensure all environmental protection measures proposed are truly effectively implemented, including 1) incorporation of EMP environmental protection measures into design and construction contracts; 2) supervision through environmental engineer over implementation by the contractor of environmental protection measures during construction and review of effectiveness and implementation of environmental protection measures; 3) inspection, reporting and archiving mechanisms in the EMP. Inspection of routine activities is carried out to reflect the timeliness and effectiveness of these activities.

Figure 4-2 Tasks of Environmental Management at Different Project Stages



4.3. Environmental Supervision

4.3.1. Purposes of Supervision

During project implementation, construction supervision engineer shall follow requirements in environmental protection design, conduct environmental supervision during construction, carry out all-round supervision and inspection of implementation of environmental protection measures by construction units and effectiveness of these measures, and address and resolve in a timely manner environmental pollution incidents.

4.3.2. Roles and Responsibilities of Environmental Supervision Engineer

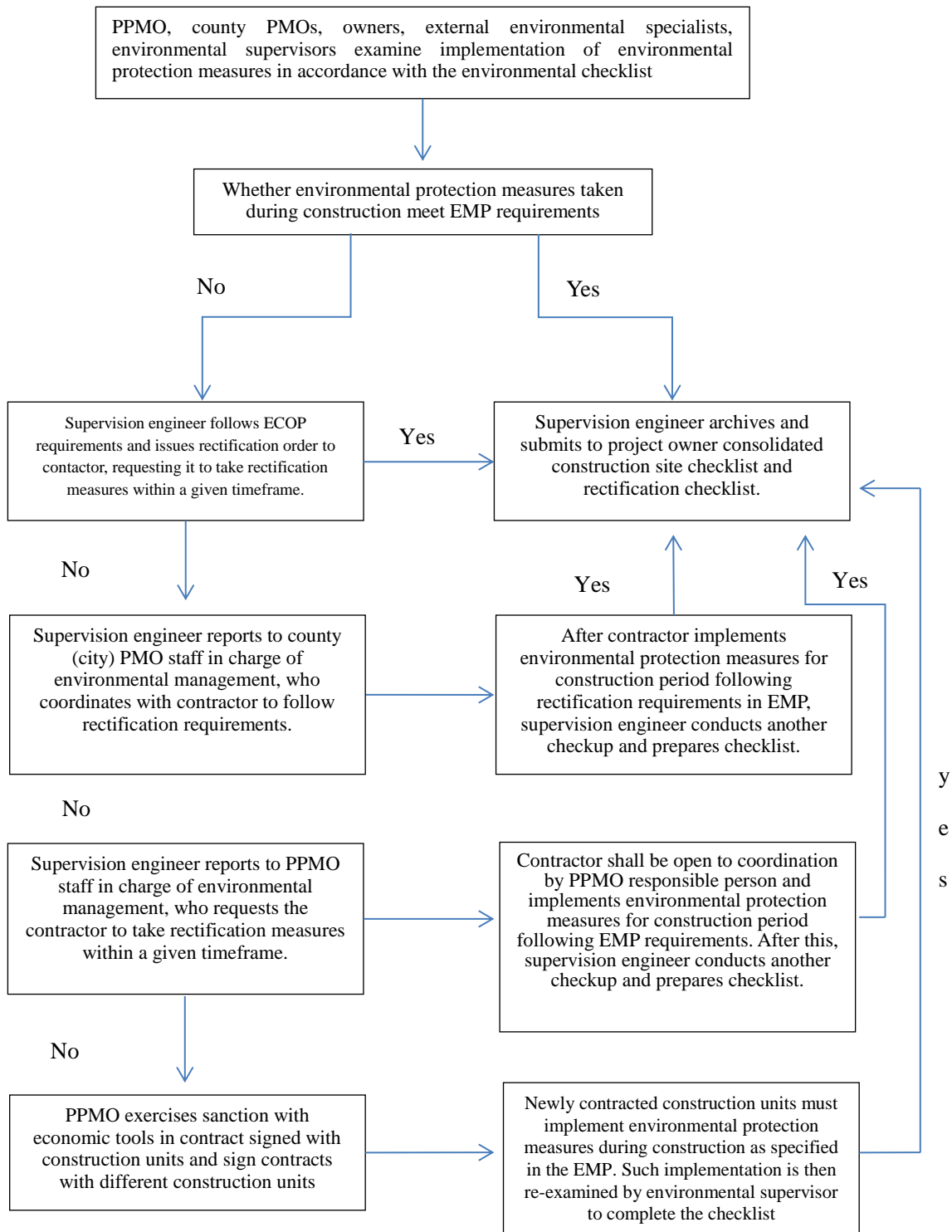
The environmental supervision engineer shall follow national and local governments' guidelines, policies, decrees, laws and regulations on environmental protection and supervise contractors to implement environmental protection-related articles in their contracts. Main roles and responsibilities are to:

- (1) prepare environmental supervision plan and develop subjects and items of environmental supervision;
- (2) take charge of reviewing environmental protection articles in tendering and bidding documents;
- (3) conduct supervision over contractors to prevent and mitigate construction-induced environmental pollution and destruction to farmland and wild flora and fauna, as well as prevent fire;
- (4) carry out all-round supervision and inspection of implementation of environmental protection measures by construction units and effectiveness of these measures, building on survey and monitoring data; and address and resolve in a timely manner environmental pollution incidents;
- (5) conduct all-round inspection of cleaning and restoration of dump sites and construction "footprints" by construction units, including side slope stability, restoration of construction footprints, afforestation and afforestation rate;
- (6) be responsible for implementing environmental supervision, reviewing relevant environmental reporting, and working out requirements for construction management corresponding to results of air quality, ambient air and noise monitoring to minimize adverse environmental impacts of construction; and
- (7) maintain good supervision documentation during daily work, prepare supervision report and participate in completion acceptance.

4.3.3. Procedures for Implementing EMP during Construction by Environmental Supervision Engineer

Environmental supervision is an important component of environmental management and is relatively independent. Therefore, an independent and qualified environmental supervision agency shall be established. In compliance with contract articles and national environmental protection law, regulations and policies, the agency shall supervise, review and evaluate implementation of environmental protection measures by construction units, and timely identify and rectify construction activities in violation of contract articles and national environmental protection requirements. The environmental supervision engineer shall inspect construction site

at least once a week, fill out and archive environmental protection checklist, propose plans for addressing relevant environmental issues/problems of construction units with their construction activities and monitor implementation of these plans, and report every six months to environmental chiefs of PMOs and environmental specialist of the World Bank. Procedures for environmental supervision during construction are provided in Figure 4-3.



4.4. The Environment Management Plan and Environmental Impact Mitigation Measures

This project consists of construction sub-project of waste collection and transfer station. Details of EMP and environmental impact mitigation measures are indicated in Table 4-3. And see the EMP of relevant projects in Table 4-4

Table 4-3 Environment Management Plan and the Environmental Impact Mitigation Measures

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
preliminary preparation							
Tendering and biding	---	1. Incorporate EMP into tendering and bidding documents; 2. Incorporate EMP into contracts with contractors, environmental supervision engineers and environmental protection contracts so as to ensure the effective implementation of all environmental protection measures.		---	—	PPMO, County PMO	---
Before Constructi on	Social environm ent	1. Timely inform the public of information about construction plan, environmental impacts, construction road, interim public traffic lines, etc. 2. If municipal services (including		---	—	County PMO, project owner, design institute, RAP compilati on team, social assessme	PPMO, County Land and Resourc es Bureau, price control authorit y

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>water, electric power, telephone line and bus line, etc.) need to be interrupted due to the construction, notice shall be posted at construction site, public traffic stops, as well as affected areas at least five days in advance.</p> <p>3. set up special land occupation office and make land acquisition and resettlement plan. Strictly implement the compensation plan for land acquisition in accordance with state and local policies about land occupation and demolition</p> <p>4.Design optimization: efforts will be made in reducing acquired land area involved in the project in designing stage. Advanced environmental protection measures should be taken to avoid</p>				nt team	

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>the secondary pollution.</p> <p>5. On the basis of consultation with the affected mass, migrants' living conditions will not decline due to the project construction as provided by relevant policies.</p> <p>6. Preferential payment policies will be formulated and implemented for the poverty group.</p> <p>7. Participatory activities will be carried out.</p> <p>8. Environmental knowledge and public health education training shall be conducted.</p> <p>9. Institutional capacity building: it is proposed that we should enhance relevant social and security safeguard training of World Bank projects for project administrators and constructors.</p> <p>10. A follow-up management mechanism will be set up for the</p>					

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>project.</p> <p>11. It is proposed that residents' inclination of " NIMBY " should be taken into consideration. The sites of waste collection, transfer, and treatment facilities shall not be either too near or too far from residential areas to avoid high cost of waste transportation. The core principle is to conduct more consultation and communication with residents to ensure their recognition of waste treatment project.</p> <p>12. Technology plays a crucial role in improving the efficiency of waste treatment. Scientific treatment of waste should be conducted in terms of technology either in simple garbage landfill sites or in new garbage treatment plants, to prevent</p>					

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		leakage and pollution.					
Land Occupatio n	Land Acquisiti on and Resettle ment	<p>1. In the planning stage, when optimized selection for schemes was conducted, much consideration was put into the impact of project construction on the local socioeconomic, which was set as a key factor in the optimized selection for schemes;</p> <p>2. Design was optimized. To reduce the demolition immigrants, existing national and local roads were used to connect planned construction area.</p> <p>3. The design was optimized to occupy wasteland and state-owned land and reduce the occupancy of arable land.</p>	---	---	Included in resettle ment action cost	Design institute, and County PMO	PPMO, and County Land and Resourc es Bureau

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
Waste collection and transporta tion design	Site Selection	1. Comply with urban and rural environmental sanitation planning; 2. Garbage collection stations and garbage transfer stations shall get close to main roads for the purpose of easy entry and exit of waste transporters; 3. Garbage collection stations and garbage transfer stations shall not be set in places that may pose a threat to traffic safety or easily cause traffic congestion.	---	---	---	Design institute	PPMO, County PMO, County Sanitati on authority , County EPB
	Structure	1. The site selection of garbage collection stations and garbage transfer stations shall comply with the principles of high efficiency, energy conservation, environmental protection, safety and sanitation; 2. After entry into garbage collection stations and garbage transfer	---	---	---		

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>stations, waste shall be directly dumped into waste containers lest waste should be dumped on the ground;</p> <p>3. The appearance and color of garbage collection stations and garbage transfer stations shall be matched with their surroundings;</p> <p>4. The architecture of garbage collection stations and garbage transfer stations shall ensure the effective control of the waste collection operation over pollutants;</p> <p>5. The wastewater collection system shall meet such requirements as corrosion resistance and leakage prevention.</p>					
Construction period							
Waste collection and transportation subproject	Common impacts caused by construction	Adopt measures in <i>General Environmental Management Regulations on Construction</i>	TSP noise	See details in monitoring plan	50	contractor	Supervision Agency, PPMO, County PMO,

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<i>Activities</i> (see annex 1)					Rural Work Departm ent. of Shangli County, County EPB
Land occupatio n	Land Acquisiti on and Resident Migratio n	1. Through basic data collection, in-depth analysis is carried out of current situation and future development of local society and economy so as to formulate a pragmatic and feasible migrant action plan in accordance with local conditions and to ensure no loss caused by the project construction for those affected by the project. 2. Public participation is encouraged. The project accepts public supervision. 3. Internal and external monitoring is strengthened by establishing effective and open mechanism and channels of feedback to shorten information processing period and to ensure that various problems can be addressed in time during project	—	—	Listed in construc tion cost	County PMO	PPMO, County Land and Resourc es Bureau, land- acquisiti on- involved villagers , committ ee

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>construction.</p> <p>4. The project site is arranged in a scientific way by occupying as less land as possible. When construction is completed, temporarily occupied area will be recovered as provided by its original land use type.</p> <p>5. Temporary storage area of earthwork is properly arranged so that it is far from environmentally sensitive points such as residential quarters, schools and the like.</p>					
Project constructi on	Social environm ent	<p>1. The project provides job opportunities for migrants, urban and rural poverty households and women, which enables them to participate in the project construction.</p> <p>2. Security and facility maintenance during construction: it is proposed that the project owner and construction institutes arrange the construction procedures after fully considering the objective demands and practices of local residents' life and work during</p>	/	/	/	County PMO, project owner, constructi on institute	PPMO, County Land and Resourc es Bureau

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		construction.					
Operation period							
Waste collection and transporta tion subproject	Associate d project	Domestic waste incineration power plant of Pingxiang city shall supply environmental acceptance reply and monitoring report.	—	—	—	Owner of domestic waste incineration power plant of Shangli County	PPMO, County PMO, County EPB
	Leachate, flushing wastewater, domestic sewage	1. Garbage trucks shall all be closed type; 2. Waste transfer station shall set up impermeable collection pool. Domestic waste water, flushing wastewater, and leachate generated in waste collection station shall be collected in the pool and sucked by impermeable suction-type sewer scavenger and transported to domestic waste incineration power plant of Pingxiang city.		—	50	Project owner	
	Waste gas	1. Waste transfer stations employ BENTAX high-energy	NH ₃ , H ₂ S	2 rounds/y ear	70		

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>reactive oxygen ion to dispel odor and use spray to dispose waste gases;</p> <p>2. Vehicles and containers capable of minimizing air emission during the process of waste reception, unloading, treatment and storage shall be selected;</p> <p>3. Garbage collection stations and nearby roads shall be frequently cleaned, and sprinkled with water to control dust when necessary;</p> <p>4. All of biological waste shall be rapidly cleaned and disposed on a daily basis;</p> <p>5. Deodorant shall be put in garbage collection sites for regularly spraying and fighting odor.</p> <p>6. Deodorant and bactericidal plants shall be raised nearby;</p> <p>7. Garbage truck shall be sealed to prevent garbage from leaking or spilling;</p> <p>8. Make and improve the transporting route of garbage truck so as to prevent vehicle exhaust from affecting sensitive sites on both sides of the road, such as</p>					

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		residential area, school, and hospital.					
	Acoustic Environ ment	<p>1. Enhance the management and maintenance of garbage trucks so as to lessen vehicle accident rate;</p> <p>2. Workers who are responsible for waste transportation should receive occupational training and hold related certificates;</p> <p>3. Make and improve the transporting route of garbage truck so as to prevent traffic noise from affecting sensitive sites on both sides of the road, such as residential area, school, and hospital;</p> <p>4. Select proper location, employ low-noise equipment, strengthen maintenance of equipment and adopt measures like vibration reduction and building sound insulation.</p>	LeqdB (A)	2 rounds/y ear	2		

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
	Domestic waste	Collected domestic waste shall be sent directly into compression room and then transported to waste treatment plant.	—	—	—		
	Social environm ent	1. Garbage collection stations shall make safe operation procedures for operation and maintenance, and operate according to the operation procedures; 2. Garbage collection stations and garbage transfer stations shall keep a clean look, regularly clean collection containers; adopt biological methods, such as spraying biological bacteria, and light and liquid disinfection system to eliminate bacteria and mosquitoes in a systematic way; Sweep and wash equipment and station floor regularly for disinfection and	—	—	3		

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>sterilization, ensure that the surface is clean, without dirt and leachate. Waste transfer stations shall spray insecticide in and out to kill mosquitoes;</p> <p>3. Administrative staff and operators of garbage collection stations and garbage transfer stations shall receive the pre-job training to grasp technical process and technical requirements of Garbage Collection Stations as well as major technical indicators and operation and management requirements of relevant facilities and equipment;</p> <p>4. Garbage collection stations and garbage collection stations shall be opened in strict accordance with the schedule time;</p> <p>5. Operators shall</p>					

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>randomly inspect waste content, and any hazardous waste and forbidden object are prohibited from entering the stations;</p> <p>6. Collected materials and organic waste are classified for the purpose of easy collection and compost;</p> <p>7. Messes are strictly prohibited from being piled up in Garbage collection stations.</p>					
	Impacts on occupatio nal health	<p>1. Any operator shall wear corresponding protection supplies such as protective clothing, gloves, respiratory masks and mouth shads before the work as required. All waste transport workers shall be provided with antiskid shoes, and all workers shall be provided with hard ground safety shoes. Safe production management staff shall inspect the</p>	—	—	5		

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		<p>employment of labor protection supplies at any time. Any person who fails to wear labor protection supplies shall not start work;</p> <p>2. Meal, smoking and drinking are prohibited from nearby areas of garbage collection stations;</p> <p>3. Workers shall be provided with immunization and health monitoring (such as hepatitis B and tetanus);</p> <p>4. Garbage collection stations and garbage transfer stations shall be kept clean;</p> <p>5. Medical treatment is required for any incised and scratch wound. The wound shall be wrapped up to avoid contacting waste;</p> <p>6. Garbage collection stations and garbage transfer stations shall be completely enclosed to avoid livestock or</p>					

Subproject/ activity	Potential impact	Mitigation Measures	Mon itori ng Item	Monitor ing Frequen cy	Cost (10,000 yuan)	Implemen ting Agency	Supervis ion Agency
		wildlife from contacting waste. Otherwise, zoonosis may spread between livestock and human and affect wildlife.					

The EMP of units to be expanded or to be environmentally checked and accepted in the associated projects is shown in the table below.

Table 4-4 EMP of Relevant Projects

Project	Constructi on situation	Overview of constructi on	EMP	Investmen t estimation (10,000 yuan)	Executive agency	
Waste Incinerati on Plant of Pingxiang City	Under constructi on	The constructi on began at October, 2015 and is expected to start trial at the beginning of 2017.	Survey and report in constructi on progress are required every half a year. After the environm ental protection acceptanc e, Waste Incinerati on Plant of Pingxiang	— —	Shangli County PMO, project owner	PPMO

			City shall provide environmental protection acceptance approval and acceptance monitoring report.			
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5. Environmental Monitoring Plan

5.1. Objectives of Monitoring

Environmental monitoring is conducted during the construction period and the operation period; the objectives are to 1) have an all-round and timely understanding of the pollution of the proposed project, 2) know the degree and scope of impacts of the project on local environment and the dynamic environmental quality, 3) report information timely to EPB and provide scientific basis for environment management of the project.

5.2. Implementation of Monitoring

Based on the environmental impact evaluation results, sensitive spots with possible obvious pollution are chosen as monitoring spots. Considering the pollution in the construction and operation period, surface water environment, ambient air, acoustic environment which are heavily influenced by the environment are selected as medium for monitoring. Monitoring items are thus decided by pollution features in the engineering analysis. Monitoring analysis methods in Technical Specifications for Environmental Monitoring of the Ministry of Environmental Protection are used and evaluation standards follow the relevant standards in EIA. Environmental monitoring agencies, county PMO and project owner-Rural Work Department of Shangli County respectively take charge of monitoring, construction, and operation. And various-level environmental protection administrations are the supervisors.

5.3. Monitoring Plan

The environmental monitoring plan of Shangli County sub-project is shown in Table 5-1.

Table 5-1 Environmental Monitoring Plan of Shangli Sub-project

Monitoring Period	Medium	Location and Number of Monitoring Points	Item	Frequency	Unit Cost (10,000 yuan/round)	Annual Cost (10,000 yuan/year)	Stage Cost (10,000 yuan/year)	Monitoring Agency	Responsible Agency	Supervision Agency
Construction period (5 years)	Ambient air	6 monitoring points: construction areas of 6 transfer stations	TSP	1 round/year, 1 day/round, once/day	0.25	1.5	9	Qualified agency	Project owner	PPMO, County PMO, EPB of Shangli County
	Noise	6 monitoring points: construction areas of 6 transfer stations	LeqdB (A)	1 round/year, 1 day/round, twice/day (once at daytime and nighttime, respectively)	0.04	0.24	1.2			
	Subtotal (10,000 yuan)									
Operation period (3 years)	Ambient air	6 monitoring points at 6 waste transfer stations	TSP, H ₂ S, NH ₃ , odor concentration	2 rounds/year, 1 day/round, once/day	0.5	6	18	Qualified agency	Project owner	PPMO, County PMO, EPB of Shangli County
	Noise	6 monitoring points: boundaries of all garbage transfer stations	LeqdB (A)	2 rounds/year, 1 day/round, twice/day (once at daytime and nighttime, respectively)	0.1	1.2	3.6			
	Subtotal (10,000 yuan)									
Grand Total (10,000 yuan)							31.8			

The environmental monitoring plan of associated project is shown in Table 5-2.

Table 5-2 Environmental monitoring plan of associated project

Name of associate	Medium	Location and	Item	Frequency	Unit Cost	Annual	Three-year	Monitoring	Responsible	Supervision
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Project		Number of Monitoring Points			(10,000 yuan/round)	Cost (10,000 yuan/year)	Cost (10,000 yuan/year)	Agency	Agency	Agency
Domestic waste incineration power plant of Shangli County	odor	Five monitoring points: four boundaries of the plant and the nearest residential area	NH ₃ ,H ₂ S	2 rounds/year, 1 day/round, once/day	—	—	—	Qualified agency	Owner of associated project	EPB of Shangli County
	waste gas	One monitoring point at waste gas main discharge outlet of incinerator	particulate matter,SO ₂ , NO _x ,CO,HCl,dioxin-like chemical, mercury and its compounds, Cd,Thallium and its compounds, antimony,As, Pb, Cd,Cr,Cu,manganese, Ni and its compounds, smoke dust, humidity of flue gas, temperature, flue gas volume	2 rounds/year, 1 day/round, once/day	—	—	—			
	ground water quality	2 monitoring points at upstream and downstream of the plant	pH, suspended solids,COD, BOD ₅ , NH ₃ -N, petroleum, TN,TP, permanganate index	2 rounds/year, 1 day/round, once/day	—	—	—			
	water quality	2 monitoring points at inlet and outlet of leachate wastewater treatment station	pH, suspended solids,COD, BOD ₅ , NH ₃ -N, petroleum, TN,TP, permanganate index	2 rounds/year, 1 day/round, once/day	—	—	—			

Note: The monitoring cost of associated project is covered by associated project owners, therefore, is not included in the monitoring cost of this project.



6. Environmental Management Training

6.1. Objectives of Training

Objectives of environmental management training are to ensure smooth and effective implementation of environmental management activities, enable relevant staff to familiarize themselves with contents and procedures of environmental management, enhance capacity of environmental management staff, and ensure effective implementation of environmental protection measures. Environmental capacity building is mainly targeted at environmental managers and environmental supervision engineers and training for them is part of the project's technical support. During project implementation, training is also provided to contractors and construction workers. Before construction is initiated, all construction units, operation units and construction supervision engineers are required to participate in compulsory training on environment, health and safety.

6.2. Training and Training Participants

The training is organized by PPMO for PMO environmental managers, project environmental management coordinators and supervision engineers before and during the construction of the project. Environmental technical experts shall take charge of the training. They can invite environmental protection specialists from universities and scientific research institutes, environmental protection designer of design institute and experts from EIA institute and supervision agencies to lecture.

The participants are all staff from PPMO and county PMOs, all environmental supervision staff, representatives from environmental monitoring agencies, and representatives from key contractors, etc.

6.3. Training Contents

- 1) World Bank environmental safeguard policy, domestic environmental protection laws and regulations, and knowledge about and application of environmental standards;
- 2) Environmental management models and environmental articles in the Loan Agreement of the project;
- 3) EA and EMP of the project;
- 4) Environmental management regulations of the project, especially those for the construction period;
- 5) Roles and responsibilities of and relationships among environmental management staff, environmental supervision staff, environmental monitoring staff, and contractors;
- 6) Preparation of environmental management report, environmental supervision report, environmental monitoring report and contractor's monthly report.

6.4. Training Program

Funding for training during implementation would be incorporated into the project budget and funding for training during operation would be included in the O&M cost.

Capacity building and training program is summarized in Table 6-1.

Table 6-1 Capacity Building and Training Program

Subject	Participant	Contents	Time s	Day /Time	No. of Participant s /Times	Budget (10,000 yuan)
Construction Period						
Environmental protection laws, regulations and policies	PMOs, Rural Work Department of Shangli County, construction units	I. Environmental protection laws and regulations	1	1	3	1
		II. Environmental policies and plans	1	1	3	
		III. Environmental management at the World Bank	1	1	3	
EMP implementation	Construction units, Rural Work Department of Shangli County	I Roles and responsibilities for environmental protection during construction	1	0.5	4	2
		II Main tasks of environmental protection during construction	1	0.5	4	
		III Main contents of environmental protection during construction	3	0.5	4	
		IV EMP (including ECOP)	2	0.5	4	
		V Improvement or amendment of EMP	1	0.5	4	
		VI Internal monitoring methods, data collection and processing, etc.	1	0.5	4	
Handling of crisis	Rural Work Department of Shangli County, Construction units	Crisis handling measures	1	0.5	4	1
Subtotal during construction						4
Operation Period						
Environmental monitoring, inspection and reporting	Rural Work Department of Shangli County	Inspection of environmental protection facilities, ecological restoration and environmental quality monitoring and report preparation	2	1	2	2
Environmental protection facilities and measures	Rural Work Department of Shangli County	1) Rules and specifications for ensuring environmental safety	2	1	2	2
		2) Emergency preparedness plan	2	1	2	
Subtotal during construction						4
Grand Total						8

7.Environmental Management Plan Cost Estimation

It is estimated that the total EMP cost is about 2.198 million yuan.

Table 7-1 List of the Cost of Project EMP (unit: 10,000 yuan)

Cost of environmental management	Cost of environmental monitoring		Training fee	Total cost of EMP implementation
	Construction period	Operation period		
180	10.2	21.6	8	2.19.8

8.Information

For the purpose of carrying out environmental management, necessary information sharing is needed among PMOs, owners, contractors and operators and all staff within these entities, which also need to disclose relevant information to external parties (stakeholders and the general public).Internal information sharing can be carried out through meetings and internal bulletins, but a formal meeting needs to be held every month and all information sharing activities shall be recorded and archived. External information sharing is carried out biannually or annually. Information sharing activities with partners shall be recorded and archived.

9.Documentation

To ensure effective operation of environmental management system, the project owner must organize to establish a sound documentation system and maintain records on the following:

- (1) Requirements of laws and regulations;
- (2) Relevant review and approval documents for the project;
- (3) Environmental media and relevant environmental impacts;
- (4) Training;
- (5) Supervision, verification and maintenance activities;
- (6) Monitoring data;
- (7) Effectiveness of corrective and precautionary measures;
- (8) Information of relevant entities;
- (9) Examination and verification;
- (10) Review and evaluation;

In addition, necessary control is needed for the above records, including identification, collection, categorization, archiving, storage, management, maintenance, storage period, and disposal of these records.

10. Reporting

During project implementation, the contractors, operators, monitoring agencies, environmental supervision engineers and PMOs shall record and report in a timely manner to pertinent departments project progress, EMP implementation and

environment quality monitoring results. Specific tasks include:

- (1) Environmental Supervision Engineer of the project documents in detail EMP implementation by month and submit in a timely manner weekly and monthly reports to the project owner and PPMO, which shall cover implementation of environmental protection measures, status of environmental monitoring and monitoring data;
- (2) The contractor and operator documents in detail project progress and EMP implementation by quarter, submits in a timely manner quarterly report to PPMO and provides a copy to the provincial environmental protection bureau (EPB);
- (3) After completing monitoring activities, the monitoring agency submits in a timely manner monitoring report to the project owner (operator) and environmental supervision engineer;
- (4) County PMO submits in a timely manner project progress report to PPMO and provides a copy to the provincial EPB. Such report (e.g. monthly report, quarterly report or annual report) must cover EMP progress, such as EMP implementation progress and effectiveness and especially environmental monitoring results;
- (5) In the event of incidents in serious violation of environmental protection regulations, the environmental supervision engineer and county PMO shall report such incidents to the local environmental protection administration and to higher level environmental protection administrations when necessary;
- (6) The project's EMP implementation report for each year must be prepared and submitted to the World Bank by March 31 of the next year. The report mainly includes the following:
 - a) Implementation of training program;
 - b) Project progress, for instance, the construction progress of sewage treatment station, waste transfer station and lengths of pipelines already paved;
 - c) Implementation of environmental protection measures, status of environmental monitoring and key monitoring results;
 - d) Whether there are public grievances; if incurred, such grievances, their solutions and degree of public satisfaction shall be recorded;
 - e) EMP implementation plan for the next year.

11. Public Grievance Redress and Project Change Mechanisms

1. Public Grievance

In the EIA process of the proposed project, views and comments of the public shall be collected through convening discussion meetings and distributing questionnaires. The public could offer their views and comments or lodge their complaints through attending discussion meetings, filling out questionnaires, sending letters, faxes or emails to or phoning the project owner or EIA institute, or through local EBPs and petition offices.

During the construction and operation period, the public could offer their views and comments or lodge their complaints through sending letters, faxes or emails to or phoning the project owner or EIA institute, or through local EBPs and petition offices. Immediately after receiving complaints about environment related issues/problems or rectification notices issued by government administrations, the EIA institute, contractor or project owner shall work together with the design institute and other relevant agencies to organize site visits and investigations, disclose rectification plans and implement appropriate rectification measures to address environment related issues/problems.

2. Environmental Requirements in Case of Project Changes

During inspection, if significant deviations from EMP contents are identified, or project changes result in significant adverse environmental impacts or significantly increase the number of people affected by these adverse impacts, PPMO shall immediately consult environmental authorities and the World Bank and set up an environmental assessment team to carry out additional environmental assessment or additional public consultation, if necessary. The revised environmental impact report that includes the EMP shall be sent to EPA for approval and then be sent to the World Bank. If the EMP is revised, the implementing agency and contractor also need to be informed of the revisions to ensure that they follow the revised version.

Annex1 General Environmental Management Regulations on Construction Activities

1. Overview

First, the construction unit and construction personnel shall implement mitigation measures proposed in this regulation to prevent inconvenience to or influence on the lives of local residents, and to reduce the project impacts on the environment during construction and operation periods;

Second, remedial measures which cannot be effectively carried out during construction shall be implemented when the project is completed:

1) Vegetation landscape of all affected areas shall be timely rehabilitated via grass planting and afforestation, etc;

2) Rubble and silt left by waterway construction shall be cleaned up to ensure smooth water flow in drains and culverts;

3) Waste gravels shall be cleared and remaining construction materials shall be properly disposed in all construction sites;

4) The borrow area shall be restored.

2. Construction personnel's Code of Conduct and Environmental Standards

This section shall be combined with national and local laws and regulations, being a guideline for construction personnel's behavior. Before breaking ground, the construction unit shall develop project construction plans, in which detailed rules for the implementation based on the specification shall be clarified. Only after engineer-in-charge's approval of the plan shall the construction begin.

2.1 Prohibited Behaviors

The following behaviors are prohibited at the construction site or in surrounding areas:

1) Logging outside the construction site;

2) Hunting, fishing, capturing wild animals, and picking plants;

3) Using unapproved toxic materials, including lead-based paint and asbestos, etc;

4) Influencing other art buildings and architectures of historical value;

5) Triggering house fires;

6) Drunk constructing.

2.2 Traffic

Selection of routes to the construction site shall be approved by the engineer-in-charge. Appropriate vehicles shall be chosen according to local road level and load capacity shall be limited to avoid damage to local roads and bridges. For damage to local roads and bridges caused by overload, the construction unit shall be responsible for the repair under the consent of the engineer-in-charge.

Vehicles with heavy emissions or strong noises should not be used. At completed areas, noise reduction devices shall be installed under normal operation.

During the implementation of the contract, the construction unit, under engineer-in-charge's consent, may take necessary traffic control measures.

2.3 Construction Personnel and Construction Camp

Whenever possible, the construction unit shall recruit local workers and offer them appropriate training.

The construction camp shall be set at the place easy to rent local houses. Domestic sewage cannot be discharged arbitrarily but disposed via surrounding existing sewage treatment system to avoid affecting nearby rivers.

The construction unit shall establish a set of system and methods for on-site

construction materials storage and generation and disposal of solid waste.

The construction unit shall provide substitute fuel while prohibit the use of wood in the camp for cooking or heating.

The on-site layout scheme shall be approved by the engineer-in-charge.

The construction unit should ensure that the construction site, warehouses, storage yards, and manufacturing equipment are not set within 500m to the river. Pollutants running into the river, especially the leakage via land or surface water during the rainy season, shall be avoided; lubricant should be recycled; in surrounding areas channels shall be dug out, at the exit of which settling pond or oil collecting pond shall be set up.

When preparing molding construction materials, construction personnel are prohibited to use wood to heat up.

Production and living areas shall be set independently in accordance with the unit's bidding section. Living areas, based on actual construction conditions, shall be set at a high location among the bidding section. The construction camp consists of living and office welfare facilities, constructing and processing plants, construction warehouses, simple repair stations and other ancillary facilities.

2.4 Waste Management and Soil Erosion

Solid waste, sanitation and hazardous waste can be effectively controlled by implementing the following measures:

2.4.1 Waste Management

1) Reduce the generation of wastes which require treatment and disposal;
2) Identify and classify the generated wastes. Were there hazardous wastes, then storage, collection, transportation and disposal must be conducted in accordance with appropriate procedures.

3) Identify and arrange treatment zones and clearly label them with what materials and substances are allowed for storage.

4) The construction unit must not dispose any waste in any environmentally sensitive area.

5) Construction wastes (including excavated soil) shall be transported to the designated disposal sites (shall be 300m away from the rivers, creeks, lakes or wetlands). Solid waste recycle-and-classify system shall be set up at designated disposal sites to dispose wastes, scrap metal, waste engine oil and the rest construction materials generated during the construction.

5) Comprehensive classification and recycling of recyclable wastes (scrap iron, scrap steel and materials packing bags sold to scrap yards; waste bricks used as materials for road base) shall be conducted. Wastes that cannot be recycled shall be timely transported to the designated construction waste dump site. During the process, sealed transportation shall be ensured and scattering be avoided. When temporary stacking is needed, waterproof, windproof and other measures shall be conducted.

6) For recyclable wastes, the recycling shall be conducted only after on-site identification and assessment and approval of the engineer-in-charge.

During the construction, any residue or sludge stacking on the ground near the construction site should be removed immediately. The stacking area should then be restored to the level approved by the engineer-in-charge.

Throughout the construction period (including preparation, maintenance, demolition and residue clean-up periods) and under the guidance of engineer-in-charge, there shall be a schedule for transportation, and measures to emergencies should be considered.

Inside the construction area, garbage bins for domestic wastes which have daily clearing, collection and classification shall be set, and the transportation of wastes

commissioned to the Sanitation Department.

2.4.2 Soil Erosion Control:

Rationally choose the construction period and try to avoid rainy season or construction in raining days. Set up construction enclosure surrounding the work site to prevent construction materials and wastes from leaking into the surface water.

Set up earthen drainage ditch around the construction site on the basis of its terrain conditions. And set up an earthen grit chamber at the outlet of the ditch, slowing down the water and settling sand.

Combine key control with surface protection, and engineering measures with phytotreatments. Emphasize in engineering measures to realize its quick effect and guarantee function. Phytotreatments are auxiliary ones for soil and water conservation, conserving soil and water in a long term and stable manner, meanwhile afforesting and beautifying ambient environment.

Protect leaf layer and organic matters of the land surface and backfill them to the damaged areas to promote the growth of native plants.

Cover the eroded barren areas with native grasses and trees, or harden the soil surface of such areas.

Proper erosion control measures shall be conducted before the rainy season, in order to better carry out the next works. Corresponding erosion measures shall be prepared at each construction point upon the completion of their subprojects.

In all construction sites, there shall be sedimentation control facilities to slow down the water, change the flow direction and settle silts before the vegetation is restored. Such facilities include material piles, stone pathways, settling pits, straw bales, hedgerows and sludge piles, etc.

Use ditches, berms, grass fences and stone piles and other measures to prevent the water from rushing into the construction site or affect on-site work.

Maintain and continue to adopt erosion control measures till the vegetation is fully restored.

Spray water on earthen roads, excavation areas, filling areas and earthwork areas if necessary to reduce wind erosion.

2.4.3 Protection Area:

Identify and designate the equipment protection area (at least 15m away from rivers, streams, lakes and wetlands); fuel shall be stored in an appropriate location, which shall be admitted by the engineer-in-charge.

Make sure all equipment are used only within the designated protected area; never dump the used oil on the ground, or into the water, sewer or drainage system.

All spilled wastes and collected oil shall be disposed in accordance with standard environment procedures or guidance. Fuel storage and backfilling areas shall be set 300m away from the intersection of drainage buildings and important water bodies, or be set under the guidance of the engineer-in-charge.

2.5 Earthworks and Side Slope Excavation and Filling

Reasonably arrange the earthworks, especially the work during the rainy season. During the construction, the side slope shall be kept solid and firm so as not to interfere other areas outside the construction area. In particular, continuous construction shall be conducted during the rainy season to complete as soon as possible the excavation and filling of the same section. Try to avoid slope erosion caused by interruption of construction due to rainy days and other reasons.

Build intercepting ditch and drainage ditch at the top and the bottom of the slope and plant grass or other plants according to the drawings to protect the slope from erosion. The Intercepting ditch shall be located higher than the slope being excavated to reduce the runoff so as not to erode the slope.

Excavated soils and stones and other materials that cannot be utilized shall be transported to the designated location after obtaining the consent of the engineer-in-charge.

The disposal site cannot be set at the place which may cause landslides, nor should it affect other agricultural plants or private lands. In addition, prevent piling materials from rushing into the surface water through rainfalls or other media. Drainage ditch shall be set up around the stacking area under the guidance of the engineer-in-charge.

2.6 Borrow and Storage Areas

Consent of the engineer-in-charge shall be obtained when opening new borrow areas at the land surface, river or utilized lands. The borrow area shall not be located in places which may damage natural or artificial drainage facilities. River borrow areas shall not be located in places which may erode or destroy the riverbed, or tend to bring a lot of sand to the downstream.

The construction unit shall ensure that all used borrow areas have a firm and solid side slope and bear a neat and level ground. No stagnant water shall be left in the drainage ditch so as not to attract mosquitoes.

Sand and gravels excavated from the river should be transported far enough for stacking. The depth of excavation of each borrow area shall not be greater than one-tenth of the width of the river, to avoid drying up rivers or eroding or damaging the riverbed. It needs the engineer-in-charge's consent to borrow soil from which the vegetation will be destroyed. When doing this, use effective dust treatment equipment and try to avoid environmentally sensitive spots or residential spots.

Each Borrow area and spoil area shall meet the following requirements:

1) Identify and classify borrow and spoil areas, and ensure that the distance between them and sensitive areas (e.g. high and steep slopes, easy-to-erosion land, areas where waste water directly goes into the sensitive water) is larger than 15m.

2) Ensure that the soils are all excavated in admitted and designated borrow areas.

3) The topsoil of newly excavated borrow areas shall be retained and be backfilled into the hole after excavating usable soils and restore the areas into flat lands or slopes; build terraces on some steep slopes to prevent soil erosion.

4) The excess topsoil shall be compacted on which vegetation shall be planted. Topsoil or residues containing organic matters are allowable for covering the surface in suitable areas to facilitate the restoration of vegetation. Native plants are easier to grow.

5) Prevent soils from rushing into the drainage ditch if there had already been one in this construction area.

6) Once the work is completed, all the waste residues generated during the construction should be cleaned from the site.

2.7 Wastewater Control

1. Construction Wastewater

Construction wastewater: the wastewater disposed by settling pond can be used for mixing concrete and watering to reduce dust, and cannot be discharged into nearby water bodies; slurry generated during the construction shall be disposed in the settling pond via mud pump and to be solidified through drainage and evaporation, and the slurry cannot be discharged into nearby water bodies; wastewater generated from washing machinery and equipment, after disposed by oil-separating sedimentation tank, can be used for watering the construction site to reduce dust, and cannot be discharged into nearby water bodies.

Drainage shall be taken into full account in terms of the layout of the

construction site, which shall also be away as far as possible from the river. Ensure that the construction site, warehouses, storage areas of diesel oil and bitumen, and facilities for manufacturing bitumen are more than 500m away from the river. Prevent pollutants from entering the river when operating the facilities, and avoid the leakage via land or surface water during the rainy season.

During the construction, the on-site ground shall be kept clean. Prevent wastewater or pollutants from entering the ditches, thus leading to the penetration of wastewater.

If on-site oil storage is needed, then anti-seepage treatment must be conducted in the warehouse. Measures should be carried out for storage and use in order to avoid the phenomena of evaporating, emitting, dripping leaking, or polluting water bodies.

Try to construct the infrastructure in the non-flood season to reduce influence of shallow groundwater level on the construction.

2. Domestic Sewage

Domestic sewage from the construction personnel shall be disposed via surrounding existing residential sewage treatment system, and cannot be discharged arbitrarily. Anti-seepage and anti-loss measures shall be conducted in accordance with relevant requirements for temporary garbage storage room.

2.8 Noise and Dust Control

To control noise and dust, the construction unit shall meet the following requirements:

1) Adopt advanced construction techniques; use wet process for crushing gravels and concrete; be equipped with dust collection device; control vehicle speed and exhaust emission from cars and coals; spray water at the construction area when needed (4 to 5 times a day is available); construction teams shall use liquefied petroleum gas, electricity and other clean energy; enhance afforestation of the construction site and strengthen labor protection for construction personnel. All these will reduce the negative impacts on ambient air.

2) At the inner side of entrance and exit for vehicles transporting materials and spoil, a car washing platform shall be established, surrounded by barriers to prevent the leakage of wastewater from washing cars. Before leaving the site, the tires and body of vehicles must be washed in the washing platform. Any sludge is not allowed to be attached to vehicles' surface. Materials and spoil shall not exceed the upper edge of the vehicle ledge during transportation, and the vehicle hopper shall be covered with a tarpaulin or be sealed.

3) Concrete mixing station and asphalt mixing station cannot be set inside the construction site; use commodity concrete and asphalt.

4) Transporting vehicles, bulldozers, excavators and other vehicles shall slow down when passing by villages or entering the construction site. Furthermore, regular repair and maintenance should be conducted to ensure vehicles' normal function and to reduce exhaust emissions.

5) Set up dust-proof barriers around the work area, especially at places close to residential areas, hospitals and schools.

6) Try to minimize the generation of dust and particulate matter in order to avoid the impact on the surrounding residential and business practices; focus on protecting vulnerable populations (such as children, the elderly, etc.).

7) Set up warning signs and use low-noise equipment at acoustic environment sensitive sections; control noise source, media of noise transmission, and traffic noise; offer construction personnel anti-noise earplugs; reasonably arrange construction time and other measures.

8) Reasonably arrange construction time according to *Standards for Ambient*

Noise Emission at Construction Site Boundary (GB12523-2011). Simultaneous operation of a large number of high-noise equipment and construction at sensitive time shall be avoided whenever possible. Try to arrange daytime operation of high-noise equipment and reduce nighttime transportation. Construction at night (22:00 - 6:00) is prohibited. Construction activities that must be carried out at night shall be approved by relevant local environmental protection department and negotiation in advance with local residents should be achieved. In addition, noise reduction measures shall be implemented (such as installing sound barriers) to minimize the impact of construction noise on local residents.

9) The speed of all construction vehicles outside the work site must not exceed 25 km/h.

10) The speed of vehicles inside the construction site must not exceed 15 km/h.

11) Try to keep the noise lower than 90 decibels of the machinery and equipment.

12) More stringent measures shall be carried out in sensitive areas (including residential areas, hospitals, nursing homes, etc.) to prevent harsh noises.

13) Appropriate measures shall be adopted to reduce the influences of construction noise and vibration on ambient environment.

2.9 Social Impact

Scientifically arrange the construction site and minimize the occupation of land. Temporary occupied area will be restored according to its original land using type after construction is completed.

Reasonably arrange temporary stacking areas of earthworks and stones which shall be away from environment sensitive spots like residential spots and schools, etc.

Timely inform the public of the construction plans, environmental impact statement, construction access roads, temporary bus route, demolition announcement and other information.

Limit nighttime construction. When construction at night is necessary, ensure the schedule is clear and reasonable and inform affected residents in advance to let them take necessary precautions.

When public facilities (such as water pipes, electricity system, telephones, bus routes, etc) cannot work properly due to the construction, affected residents shall be informed at least five days in advance through the form of notice posting at the construction site, bus stops and the affected areas.

2.10 Construction Safety

Responsibilities of the construction unit include protecting every individual surrounding the site, namely to avoid impacts on individual's personal safety and property caused by the construction. The construction unit has the responsibility to comply with national and local safety regulations and take all necessary measures to avoid accidents. Measures may include:

1) Setting up noticeable safety signs at construction access roads and the entrance and exit of the construction site;

2) Dispatching personnel to guide the traffic near schools in the students' rush hour;

3) Setting up sufficient traffic warning signs (including painting, frames and markers, etc.), road signs and guardrails to ensure the safety of pedestrians during the construction period;

4) Providing safety training to all construction workers before the construction is initiated;

5) Providing construction workers with and force them to use personal protective equipment and clothes (such as goggles, gloves, masks, dust cover, and helmet, etc.);

6) Equipping each site with a safety information bulletin; warning signs shall be set up in the chemicals storage warehouse;

7) Requiring all workers to know the safety information about various materials and clarify to the construction personnel the possible risks for them and their families (especially for pregnant women or families planning a pregnancy) when using these materials, and encourage workers to share relevant information;

8) Making sure that the waste oil or other toxic materials are disposed by specially trained workers;

9) Suspending the construction when encountering heavy rains or other emergencies;

10) Ensuring that the electrical equipment and machinery shall be able to withstand a certain level of earthquake.

2.11 Disposal of Cultural Relics and Heritage Sites during Construction Period

During excavation and construction, if heritage sites, historic sites, human remains, grave yard or individual graves were found, disposal shall be conducted according to the following procedure:

1) Stop construction activities at the discovery site;

2) Draw and mark the discovery location and area;

3) Protect the site to prevent any possible damage to cultural relics. When movable cultural relics or sensitive fossil remains were found, personnel shall be set to ensure their safety until the local relevant government departments or national cultural relics management department take over the charge;

4) After cultural relics were found, the finder shall, within 24 hours, inform the patrolling supervision engineer who will be in charge of contacting local relevant government departments or national cultural relics management department;

5) Before deciding follow-up works, the local relevant government departments or national cultural relics management department will charge for the protection and conservation of the discovery site and cultural relics. Experts from the national cultural relics management department will prepare preliminary assessment on the cultural relics based on related cultural relics assessment criteria, namely from aspects of aesthetic, historical, scientific, social and economic value, to analyze the value and significance of the discovery;

6) Local relevant government departments and national cultural relics management department will decide how to handle the discovery, which includes how to modify construction plan (for example, when immovable cultural relics with cultural or archaeological sense were found), and how to save, repair and utilize the heritage sites, etc.;

7) Local relevant government departments shall deliver written materials to the project manager and inform treatment decisions on the cultural relics;

8) In order to protect the safety of cultural relics and heritage sites, the construction shall be resumed only after obtaining permission of local government or the national cultural relics management department.

2.12 Hazardous Waste

If hazardous waste or suspected hazardous waste (asbestos-containing substances generated from disposal of construction waste) might be generated in the construction site, the construction unit needs to develop a hazardous waste management plan, which, after engineer-in-charge's approval, applies to all personnel involved in disposal and transportation work. Works to clear and dispose hazardous construction waste shall be conducted by specially trained personnel in accordance with national and provincial regulations or universally accepted procedures.

2.13 Health Service and HIV/AIDS Education

The construction unit shall provide workers with basic first aid services and emergency facilities, including medical devices and mode of operation for personal use. Injured workers shall be treatable before being sent to the hospital.

The construction unit has the responsibility to develop a plan to prevent the spread of sexual diseases (especially HIV/AIDS) among workers.

The construction unit shall add health plan outline into its construction plan, offering workers advice to keep healthy during the construction. The outline shall be approved by engineer-in-charge before the construction is initiated.

3 Environmental Supervision Measures

The engineer-in-charge/construction supervisor shall ensure the implementation of above requirements. Non-compliance of the contract will lead to suspension of the construction or other sanctions until the issue has been resolved under the engineer-in-charge's satisfied manner. The construction unit shall also follow relevant national and local regulations related to environment, public health and safety.

Annex 2 Checklist of Construction Site before Commencement of Work

Serial No.	Environmental Problem	Check Result (Marked with “√”)	Remark
1	Whether the project involves natural habitat, material culture resources, involuntary resettlement and other World Bank safeguard policies	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
2	Whether there are important vegetation and trees within the scope of project land occupation	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
3	Whether project construction road will cause significant impacts on going out of surrounding residents	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
4	Whether there are the public (residential community, school, hospital, office area, etc.) vulnerable to the impacts of work construction nearby the project	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
5	May cause the deterioration in the quality of life of nearby town	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
6	Whether project construction needs to interrupt municipal services (including water, electric power, telephone, bus line, etc.)	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
7	Whether project construction needs demolition	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
8	Whether rainy season will be affected by flood	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
9	Whether land outside project areas is temporarily occupied	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
10	Whether electric power, telecommunications and other municipal service lines are involved within and nearby the scope of project construction	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
11	Whether there is surface water body within and nearby the scope of project construction	Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	
Others		Yes <input type="checkbox"/> No <input type="checkbox"/> Not Involve <input type="checkbox"/>	

Annex 3 Checklist of Construction Site Environment

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			
Contract Number and Name		Check Result (Marked with “√”)			Remark
Inspect Item		Yes	No	Not Involve	
1. General Requirements	1.1 Whether effective measures for preventing and controlling atmospheric pollution, water and soil pollution and noise pollution as well as for improving environmental health are in place in construction organization design of the project				
	1.2 Whether environmental protection, environmental health management and inspection system for construction site are established				
	1.3 Whether environmental protection, environmental health management and inspection for construction is recorded				
	1.4 Whether operating personnel are provided with necessary protective equipment and effective occupational-disease-prevention measures are taken				
	1.5 Whether the personnel engaged in occupational-disease-inductive operation are provided with regular physical exam and training (with relevant physical exam certificate and training record)				
	1.6 Whether diet health, sunstroke prevention, cooling, cold protection, warmth keeping, gas poisoning prevention and epidemic prevention for operating personnel are in place in combination with seasonal characteristics				
	1.7 Whether education training and assessment for operating personnel at construction site contain laws and regulations relating to environmental protection and environmental health (with related records and documents)				
	Others (shall specify)				
2. Site Layout and Temporary Facilities Construction	2.1 Whether the construction area at the construction site is clearly separated from office area and living area and whether relevant isolation measures are taken				
	2.2 Whether the construction area is neat and orderly				
	2.3 Whether the access of the construction site is marked with enterprise name or enterprise logo, whether the visible place of main access is set with project profile plate meeting the requirements				

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			
Contract Number and Name		Check Result (Marked with “√”)			Remark
Inspect Item		Yes	No	Not Involve	
	2.4 Whether the public is informed in advance when the construction needs to interrupt municipal services (including water, electric power, telephone, bus line, etc.)				
	2.5 Whether the existing building and infrastructure are utilized as temporary facilities of the construction site				
	2.6 Whether newly built temporary house is reasonable in land occupation and meets safety and fire control requirements (with related certificates)				
	2.7 Whether the construction of temporary facilities uses clay bricks				
	2.8 Whether oil, chemical solvent and other items stored at the construction site set special warehouse and warning signs				
	2.9 Whether anti-seepage treatment is made for the ground of oil and chemical warehouse, and whether such emergency treatment materials as absorption bag/sands/bits of wood are in place in the warehouse				
	2.10 Whether collective staff dormitory is set in unfinished building				
	2.11 Whether temporary facilities are demolished within one month upon completion of the construction work				
	Others (shall specify)				
3. Operating Conditions and Environmental Safety	3.1 Whether enclosed color steel fence with the height of no less than 2.5m is set at the construction site, and whether the height of sensitive section is no less than 3.m				
	3.2 Whether the construction site sets qualified bulletin board, indicating environmental protection and civilized construction system, and disposal process for emergencies, etc.				
	3.3 Whether the construction unit takes protective measures to ensure the safety of buildings, structures and underground pipelines adjacent to construction work				
	3.4 Whether tall scaffolding, tower crane and other large machinery and equipment at construction site keep a safe distance from overhead transmission conductor, and whether high voltage line adopts insulating material for safety protection				
	3.5 Whether mandatory safety protection measures are taken for sidewalks and vehicle access surrounding construction work, and				

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			
Contract Number and Name		Check Result (Marked with “√”)			Remark
Inspect Item		Yes	No	Not Involve	
	whether lighting indicating device is set in the nighttime				
	3.6 Whether visible safety warning sign meeting national standard is set at dangerous section of the construction site				
	3.7 Whether the construction site adopts corresponding safety technology measures based on season change to achieve civilized and safe construction conditions				
	3.8 Whether fire extinguishing equipment is kept in good condition, and whether escape way is without obstruction				
	Others (shall specify)				
4. Dust Pollution Control	4.1 Whether construction site road reasonably utilizes the existing or proposed road in and surrounding the site				
	4.2 Whether hardening treatment is made based on its usage when constructing new road, and whether the road section producing dust controls dust by sprinkling				
	4.3 Whether materials are piled up together at construction site				
	4.4 Whether the second location selected to pile up materials is reasonable				
	4.5 Whether site material storage area, processing area and large mould storage area are flat and solid				
	4.6 Whether fine particle granular materials and the materials easy to float in the air at construction site adopt sealed storage, and whether shielding measures are taken for their handing and transportation				
	4.7 Whether covering, solidifying or greening measures are taken for earthwork piled up together				
	4.8 Whether spoil is utilized or transported to designated disposal sites				
	4.9 Whether bare ground at office area and living area of the construction site controls dust by sprinkling and is greened and beautified based on the actual situation				
	4.10 Whether earth, waste and construction garbage are transported using closed vehicles				
	4.11 Whether the facilities washing vehicles are set at the access of the construction site, and whether the road between vehicle washing facilities and the exit of the site is paved with concrete, asphalt, straw mattress or broken brick hardcore to avoid bringing				

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project							
Name of project				Name of Work Site			
Contract Number and Name				Check Result (Marked with “√”)	Remark		
Inspect Item				Yes		No	Not Involve
	silt out of the site						
	4.12 Whether the construction site uses ready-mixed concrete and ready-mixed mortar						
	4.13 Whether dust prevention and dust removal measures are taken when conducting concrete and mortar mixing operation						
	4.14 Whether earth backfill, transportation and other construction that may produce dust pollution are prohibited in the weather with force four wind						
	Others (shall specify)						
5. Harmful Gas Emission Control	5.1 Whether all kinds of wastes are burned at construction site						
	5.2 Whether construction vehicles and mechanical equipment are kept in good condition, and whether the exhaust gas emitted meets the emission standard provided by the state						
	5.3 Whether decoration materials adopt building materials qualified through the verification of legal detection unit (with certificate of conformance)						
	5.4 Whether wood board and other wood materials used for interior decoration are prohibited from using asphalt, coal tar class anti-corrosive and moisture-proof finishing agent.						
	5.5 Whether the kitchen in living area is installed with lampblack treatment facilities as required						
	Others (shall specify)						
6. Water Pollution Control	6.1 Whether sedimentation tank is set at the place washing mixer foreground and transport vehicles at construction site						
	6.2 Whether wastewater is directly drained into municipal sewage pipe network or river						
	6.3 Whether wastewater is recycled or used for dust suppression through sprinkling after secondary precipitation						
	6.4 Whether sediment disposal is conducted when sediment in sedimentation tank reaching 1/4 depth of the tank, whether sediment in sedimentation tank is cleared and transported to designated place						
	6.5 Whether the canteen sets separation tank, and whether qualified cleaning unit is entrusted to timely clear it away						
	6.6 Whether closed waste food bin is set outside the canteen and is						

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			
Contract Number and Name		Check Result (Marked with “√”)			Remark
Inspect Item		Yes	No	Not Involve	
	cleared away in a timely manner				
	6.7 Whether septic tank of temporary toilet set at construction site conducts anti-seepage treatment				
	6.8 The construction site shall set drainage ditch. Whether waste water is drained into municipal sewage pipe network or river after precipitation, and whether drainage ditch is smooth				
	Others (shall specify)				
7. Noise Pollution Control	7.1 Whether the requirements of construction time is strictly followed				
	7.2 Whether surrounding residents are informed of nighttime continuous construction, and whether related formalities for nighttime continuous construction are handled				
	7.3 Whether shielding, closing and greening measures for noise absorption and noise insulation purposes are taken for the construction site				
	7.4 Whether low noise equipment are adopted and maintenance for the equipment is well conducted				
	7.5 Whether the equipment producing noise are set at the side far away from residential community				
	7.6 Whether noise reduction measures such as enclosing are taken to the equipment producing noise				
	7.7 Whether such measures as speed limit and no honking are taken for construction vehicles				
	7.8 Whether the equipment (air compressor, electric generator, etc.) producing noise are placed in enclosed equipment room				
8. Waste Control	8.1 Whether the construction site sets enclosed refuse storage area, and whether construction waste and domestic garbage are stored separately and cleared away and disposed according to the provisions				
	8.2 Whether corresponding container or pipe transportation are adopted for the removal of construction waste in buildings				
	8.3 Whether wastes produced from construction, demolition and site cleaning are disposed separately, recovered and recycled				
	8.4 Whether construction waste cleaning unit holds waste disposal qualification and business license approved by relevant authority				
	8.5 Whether abandoned oil and chemical solvent are stored in a				

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			Remark
Contract Number and Name		Check Result (Marked with “√”)			
Inspect Item		Yes	No	Not Involve	
	centralized way, and entrusted to qualified unit for disposal				
	8.6 Whether construction equipment has obvious oil spatter				
	8.7 Whether the construction camp has set enclosed refuse storage area to collect the workers’ domestic garbage, which shall be timely cleared away as required.				
	8.8 Whether septic tank is timely cleared and buried with land upon completion of the construction				
	Others (shall specify)				
9. Soil Erosion and Control	9.1 Whether utilize the existing legal borrow area and the waste abandoning place determined by local sanitation department				
	9.2 Whether newly built borrow area obtains approval from relevant authority, and whether protective measures are taken to the side slope of borrow area				
	9.3 Whether surface soil is cleaned and stored to ensure that it is used for vegetation restoration upon completion of the construction				
	9.4 Whether intercepting ditch and headrace are built to lead water flow formed in rainy season away to avoid the washout of surface runoff to work				
	Others (shall specify)				
10. Preservation of Cultural Relics	10.1 In case cultural relics or suspected cultural relics is found during construction period, the construction shall be immediately stopped and the site shall be well protected, while at the same time reporting to local administrative department of cultural relics for disposal, the construction can be resumed only after disposal of relevant department				
	Others (shall specify)				
11. Vegetation Protection	11.1 Whether such behavior as cutting down trees outside construction site exists				
	11.2 Whether the layout of construction site is reasonable (judging from the point of the damage caused by work implementation to vegetation)				
	11.3 Whether effective measures are taken for the vegetation damaged and bare soil caused due to the construction to avoid soil erosion and loss (adopting such measures as covering with gravels, planting fast-growing grass, etc.)				
	11.4 Whether original vegetation area destroyed is restored or				

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			Remark
Contract Number and Name		Check Result (Marked with “√”)			
Inspect Item		Yes	No	Not Involve	
	reasonably greened upon completion of the construction				
	11.5 Whether alien species are introduced when conducting ecological restoration and greening for vegetation				
	Others (shall specify)				
12. Risk Prevention	12.1 Whether accident prevention plan is formulated				
	Others (shall specify)				
13. Occupational Health	13.1 Whether warning signs or warning instructions are set at operating post, equipment and place vulnerable to occupational hazards				
	13.2 Whether operating personnel wear ear plugs for hearing protection when conducting high noise construction work				
	13.3 Whether anti-corrosive and waterproof operation in basement where good natural ventilation cannot be guaranteed are equipped with mandatory ventilation facilities. Whether the operating personnel wear respirator or protective mask in the workplace with toxic or harmful gases				
	13.4 Whether the operating personnel wear dust mask in the workplace with dust				
	13.5 Whether the operating personnel wear protective mask, goggles, gloves and other personal protective equipment when conducting welding operation				
	13.6 Whether the construction site is equipped with sunstroke prevention and cooling supplies when conducting high temperature operation, and the work-and-rest timetable shall be reasonably arranged				
	Others (shall specify)				
	14. Hygiene and Disease Control	14.1 Whether staff meals, drinking water and rest area at construction site are in compliance with health standards (with health certificate)			
14.2 Whether dormitory, canteen, bathroom and toilet are equipped with ventilation and lighting facilities, and maintained by special personnel					
14.3 Whether construction site dormitory meets the requirement of setting open type window; the beds in the dormitory shall not					

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project					
Name of project		Name of Work Site			
Contract Number and Name		Check Result (Marked with “√”)			Remark
Inspect Item		Yes	No	Not Involve	
	exceed two layers, a wide bed for a number of people is strictly prohibited				
	14.4 Whether the canteen obtains effective sanitary license issued by relevant authority, whether canteen workers hold effective health certificate				
	14.5 Whether the canteen is located far away from toilet, refuse storage area, toxic and harmful pollution sources				
	14.6 Whether the canteen sets independent food preparation room and storage room, whether the lower part of door leaf sets rat guard no less than 0.2m				
	14.7 Whether toilet, sanitation facilities, drainage ditch and damp area are regularly disinfected (with related records)				
	14.8 Whether the living area sets closed container with regular fly killing and timely clearing				
	14.9 Whether the construction site sets health center, equipped with health kit, commonly used drugs and bandage, tourniquet, neck collar, stretcher and other emergency equipment				
	14.10 When construction personnel develop infectious diseases, food poisoning and acute occupational poisoning, whether it is timely reported to the epidemic prevention department and competent department in charge of construction of the locality, and disposed according to relevant regulations stipulated by the epidemic prevention department				
	Others (shall specify)				
15. Traffic Safety	15.1 Whether safe driving is emphasized on drivers and safety education & training is carried out regularly				
	15.2 Whether driving time is limited, and drivers take turns in driving; whether driving on dangerous road and in dangerous time is avoided				
	15.3 Whether the parts used for vehicle maintenance are approved by the manufacturer, and whether vehicle parts are purchased timely for maintenance purpose				
	15.4 Whether separation of people and vehicles are achieved				
	15.5 Whether cooperate with local community and competent authority to improve road signs and strengthen the visibility of road signs				

Checklist of Construction Site Environment for World Bank-financed Shangli County Water Environment Management Project				
Name of project		Name of Work Site		
Contract Number and Name		Check Result (Marked with “√”)		Remark
Inspect Item		Yes	No	
	15.6 Whether traffic safety and pedestrian safety education are carried out in the communities surrounding project construction and the communities nearby school			
	15.7 Whether materials are purchased locally as far as possible			
	15.8 Whether drivers operating the vehicles hold driving license			
	Others (shall specify)			
Others (shall specify)				
The construction stage when inspecting: _____ Date of inspection: _____				
Time of inspection: _____				
Weather record: _____				
Signed by on-site inspector: _____ Signed by environmental supervisor: _____				
Description: ① The problem observed, unqualified situation described, corrective and preventive actions and suggestions put forward can be filled in remark.				
② If it is found through on-site inspection that measures are unqualified and need to be improved, environmental supervisor shall immediately issue “Environmental Rectification Notice” to the contractor and record the serial number of “Environmental Rectification Notice” in Remark. The detailed corrective actions carried out by the contractor shall be recorded separately.				
③ As for the specific subproject and environmental problems, local environmental situation and construction content can be combined to make appropriate adjustment to this form and to adopt appropriate environmental protection measures.				

Map 1 Emergency Handling Flow Chart in case of Discovering Cultural Relics

