

China: Anhui Xuancheng Infrastructure for Industry Relocation Project

Supplemental Environmental Management Plan (EMP)

(Project restructuring 2016)

Xuancheng Economic and Technological Zone

Management Committee

Anhui Academy of Environmental Science Research

November 2016

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1 Overview of Project at Appraisal

The economic development zone of Xuancheng for hosting industries that are relocated from the East China regions is located to the west of the main city of Xuancheng. Referred to as Jidi in Chinese, it is also the second phase of the Xuancheng Economic and Technological Development Zone (XETDZ) with a land area of 25.6 km². The infrastructure project includes seven physical components, i.e., urban transportation, municipal water supply, municipal gas supply, municipal wastewater treatment, municipal solid wastes management, river rehabilitation, and land/environmental rehabilitation around the high-voltage power corridor. The World Bank loan financing is to support three components of urban transportation (roads and bridges), water supply and wastewater in project area to the north of the Baocheng Xi Road in an area of 20.2km². At the project appraisal, It was held that part of the zone to the south of the Baocheng Xi Road of about 5km² was not a development priority, and therefore, was not included in the scope of the Bank financed project.

The World Bank financed project specifically includes the following.

(1) twenty-one roads (21) and the water supply pipelines, storm and wastewater collectors beneath the roads, as well as the facilities (landscaping, lighting, traffic engineering facilities, etc.) associated with the roads,

(2) two(2) bridges for access to the project area, both of which lead to the main Xuancheng city across the Hehang Highway (expressway), and

(3) a wastewater treatment plant (WWTP) of 25,000m³/day capacity with its inflow and effluent trunk pipelines. The WWTP is located outside the project area.

2 Implementation Progress

According to the updated procurement plan, there are 15 contract packages in the World Bank supported Xuancheng Infrastructure Project for Industry Relocation. As of today, nine(9) packages have been tendered with accumulative bid value of CNY430.12 million. Among the nine(9) contracts that are tendered, seven(7) are civil works contracts already started including three(3) that are nearly completed.

The part to the south of the Baocheng Xi Road of the XETDZ, phase 2, remains undeveloped.

3 Changes to the Project

Because of the macro-economic and market demand changes, subject to the consents from the state, provincial and municipal governments, the XETDZ Administrative Committee has reached agreement with the World Bank Task Team to reduce the scope of the project implementation by dropping the catchment to the north of the Huanshan Bei Road out of the scope of the project implementation. Conditions are so far not available for developing this area of about 5.6km². The Bank financing will continue to support the road system and infrastructure development between the Huanshan Bei Road (included in the project) on the north and the Baocheng Xi Road (existing road), with an area of 14.6km². The WWTP with its inflow and effluent trunk pipelines to be implemented under the project is still included in the project.

The World Bank Project Area is thereby reduced to 14.6km² from 20.2km² at the appraisal, with investment changed accordingly. Seven(7) roads (with associated ground utilities like water supply, storm drainage and wastewater collection pipelines) and a Huanshan Bei Road

Underpass are dropped and in addition, four(4) roads are shortened. As a result, the total road network length is cut down to 37.6km from 60km at the appraisal.

Per the technical analysis, upon the road network development and built-up of the associated water supply, drainage and wastewater utilities, lighting, landscaping and other works in the stage-1 Project Area, the area of the World Bank project will form a system of its own with a developed road network and functional infrastructure services, which will meet the current development demand of the XETDZ. Furthermore the development intensity will decrease after the change and the resettlement and environmental impacts will be reduced.

For the 5.6km² catchment to the north of the Huanshan Bei Road, which is dropped out of the scope of the Bank financed project, conditions are so far not available for development. The Xuancheng Municipal Government has made a commitment to adhere to holistic economic development, environmental protection and social progress in harmony by keeping up to the high social and environmental code of practice and continued adoption of the social and environmental safeguard instruments of the project during the development of this catchment when the development conditions are available. The government will monitor any activities that might take place in the catchment and keep the World Bank informed.

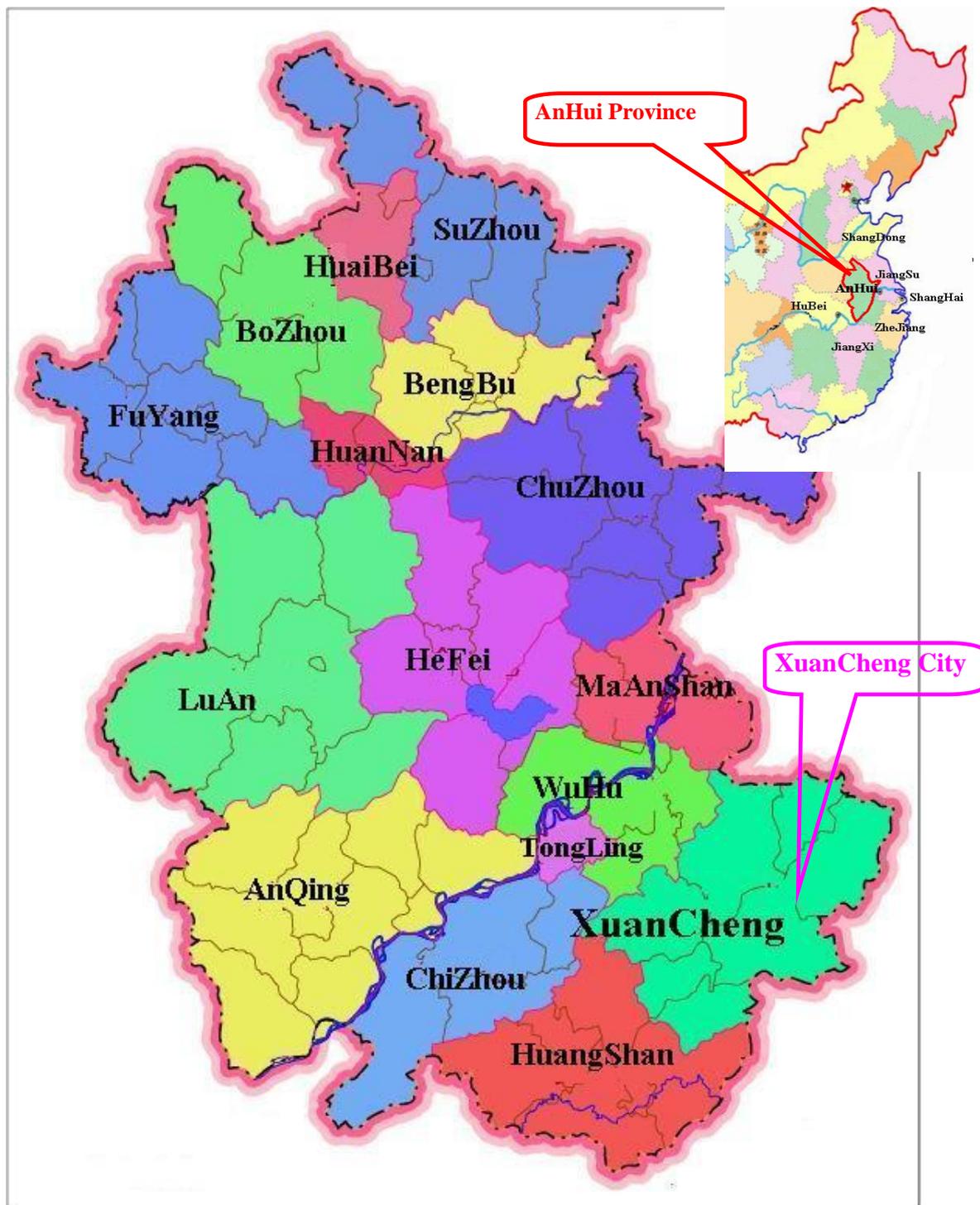


Figure 1 Project location

1.1. Project Description

The World Bank financing is to support such components as the urban transport infrastructure (roads and bridges), water supply, and wastewater, specifically as follows. (i) 14 urban roads and 1 bridges, along with associated facilities (bus stations/stops, landscaping, lighting, traffic management etc.) and associated sub-surface infrastructure services, including storm water drainage, water supply and sewage networks. (ii) Construction of a wastewater treatment plant, the conveyance sewers to the WWTP, treated effluent discharge pipes from the WWTP and the treated effluent outfall into the river. Table 1-1 shows the

physical components that are covered by the EIA and EMP of the Project, including those that are partly Bank financed and non-Bank financed.

Table 1-1 Infrastructure Development of XEDTZ2

Activity Description	Partly Financed by the Bank Loan	Non-Bank Financed
1. Urban Transport Component		
1.1 Construction of 37.60 km of 14 roads (including associated landscaping, lighting, and other facilities)	Yes	
1.2 Construction of 1 highway interchanges	Yes	
1.3 Construction of 23 km of 24 roads (including associated landscaping, lighting, and other facilities)		Yes
2. Water Supply Component		
2.1 Construction of 48.81 km of subsurface networks for water supply	Yes	
2.2 Construction of 76.71 km of subsurface networks for water supply		Yes
2.3 Construction of a 30,000m ³ /d booster station, and 14km of water mains		Yes
3. Wastewater Component		
3.1 Construction of 70.10 km of subsurface networks for drainage	Yes	
3.2 Construction of 50.72 km of subsurface networks for wastewater collection	Yes	
3.3 Construction of a 25,000 m ³ /d wastewater treatment plant with 10.71 km sewer mains	Yes	
3.4 Construction of 45.03 km of subsurface networks for wastewater collection		Yes
4. Solid waste component, including building 143 drop-off points, 4 solid transfer stations, 17 public toilets, and 19 refuse trucks		Yes
5. Rehabilitation of 17.25 km of river channel (7.6km upstream reach of Changqiao River, 6km downstream reach of Xijing River and 3.75km of tributary)		Yes
6. Gas supply component		
6.1 Construction of 70.65 km of natural gas networks (DN200-600), a natural gas storage/distribution facility (22,000Nm ³)		Yes
6.2 Construction of a combined natural gas pressure regulation and gasification station (30,000Nm ³ /d);		Yes
6.3 Construction of a compressed natural gas filling station		Yes
7. Landscaping of 14.66 km corridor under a power transmission line		Yes

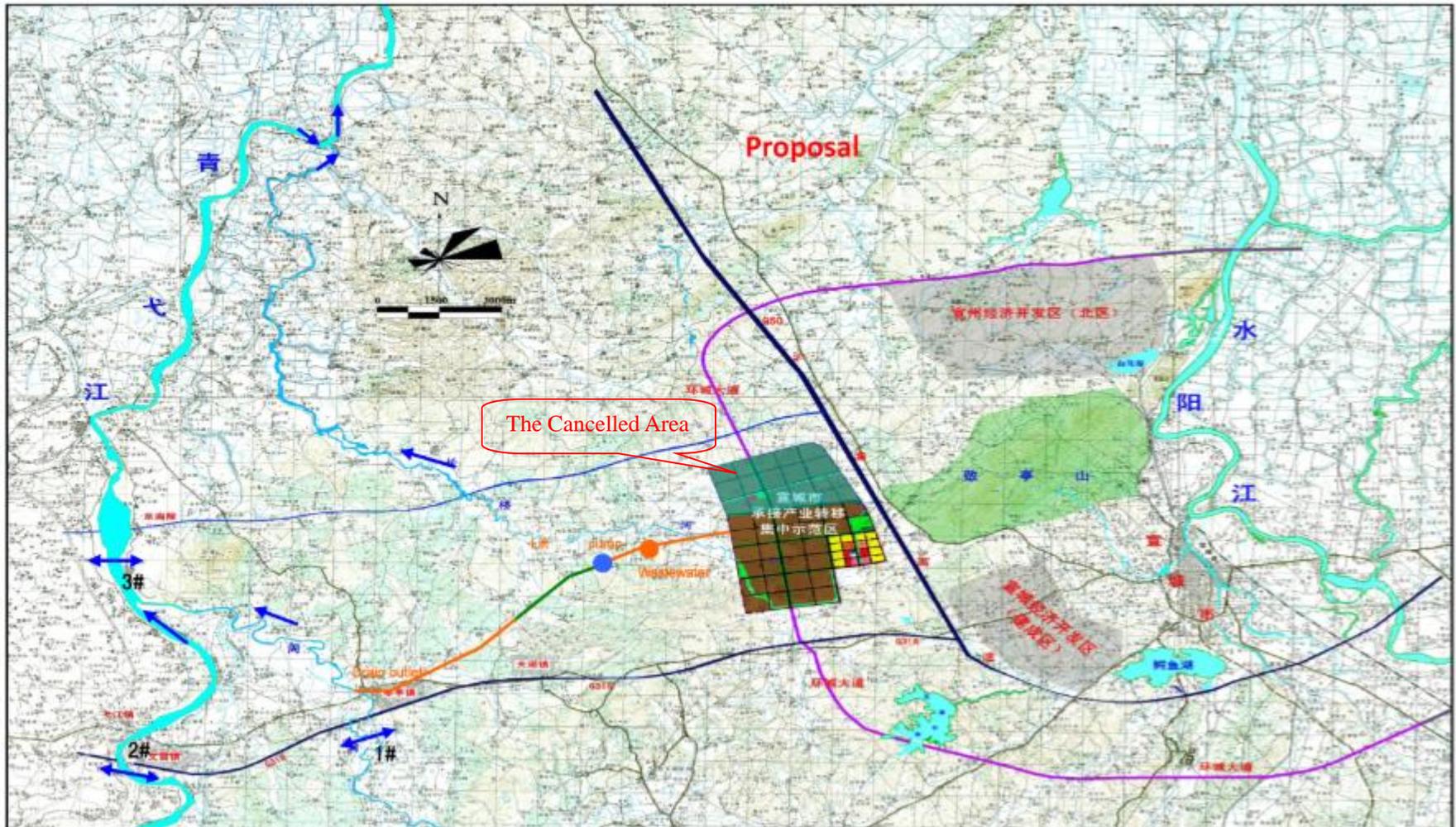


Figure 2 XEDTZ2 Location

1.2. The EMP Objectives

The EMP focuses on executing the mitigation measures for the identified environmental impacts and monitoring the effectiveness of the measures over the life cycle of the Project. Based on the EIA and SEA, the EMP is developed in accordance with Chinese environmental laws and guidelines, World Bank's safeguard policies, and best practices from similar projects. The EMP objective is to ensure consistency between EIA and EMP to achieve appropriate standard of environmental protection. The EMP effectively meets manages the regulatory requirements and directs the project owner in the management contractors and sub-contractors.

1.3. The EMP Structure

The key components of the EMP include procedures for overall environmental management during Project construction and operation. EMP covers the following elements

- Environmental management roles and responsibilities;
- Mitigation measures;
- Supervision and Monitoring Plan;
- Contractor Environmental Specifications;
- Emergency Response Plan;
- Mitigation and monitoring plan of the cumulative environmental impacts;
- Soil and Water Conservation Plan;
- Public Engagement and Stakeholder Participation Plan;
- Environmental Training Plan;
- EMP Budget

EMP provides sufficient information for the Project owner, contractors, sub-contractors to implement the EMP, we will emphatically implement the following matters:

- Meet the environmental requirements set by the P. R. China, Anhui province and World Bank;
- Fulfill all environmental and socio-economic conditions associated with project approvals, permits and policies set out by the state, provincial and municipal levels;
- Develop, promote and foster a shared sense of responsibility for environmental and social performance during the implementation of the Project;
- Promote environmental awareness and understanding among regulatory bodies and XETDZMC including its retained contractor(s) through training and identification of roles and responsibilities towards environmental and social management;
- Monitor environmental and social performance throughout the Project life cycle and adopt an adaptive management approach to realize the continuous improvement and minimum cumulative impact in XETDZ2;
- Work with the local communities and affected stakeholders to ensure that they benefit as a result of project development;
- Promise to send notice to inviting local stakeholder participation in every stage of the project monitoring process.

4 Legal and Regulation Framework

The Project complies with the environmental assessment laws and regulations in China and the World Bank safeguards policies. Requirements of compliance with the China's laws and regulations and Bank's policies are described in this section.

4.1 Domestic Laws and Regulations

4.1.1 Environmental Protection Laws and Regulations

- (1) PRC's Environmental Protection Law (December 26, 1989);
- (2) PRC's Environment Impact Assessment Law (the President's Command No. 77, September 1, 2003);
- (3) PRC's Air Pollution Prevention and Control Law (September 1, 2000);
- (4) PRC's Water Pollution Prevention and Control Law (June 1, 2008);
- (5) PRC's Ambient Noise Prevention and Control Law (March 1, 1997);
- (6) PRC's Solid Waste Pollution Prevention and Control Law (April 1, 2005);
- (7) PRC's Clean Production Promotion Law (January 2003);
- (8) PRC's Circular Economy Promotion Law (August 2008);
- (9) PRC's Cultural Heritage Conservation Law (October 28, 2002);
- (10) PRC's Land Management Law (August 2004);
- (11) PRC's Urban Rural Planning Law (January 2008); and
- (12) PRC's Water Soil Conservancy Law

4.1.2 Environmental Protection Laws and Regulations

- (1) Implementation Ordinance of PRC's Water Soil Conservancy Law (August 1, 1993);
- (2) PRC's River Management Ordinance (June 10, 1988);
- (3) Environmental Protection Regulations on Development Projects (November 29, 1998);
- (4) National Ecological and Environmental Protection Compendium (April 10, 2001);
- (5) PRC's Clean Production Promotion Law (January 2003)
- (6) PRC's Circular Economy Promotion Law (August, 2008);
- (7) Interim Method for Public Participation of Environmental Impact Assessment (Huan Fa 2006[No.28]);
- (8) Circulation on Strengthening EIA Management and Preventing Environmental Risks (Huan Fa (2005) No. 152);
- (9) Classification and Management Inventory for EIA of Development Projects (National Environmental Protection Administration (NEPA), October 2008);
- (10) Environmental Protection Management Regulations on Transport Development Projects (Minister's Command No. 5, Command from Ministry of Communication, May 2003);
- (11) Circulation to Strengthen EIA Management of IFI Financed Development Projects (ref. Huan Jian [1993]#324, NEPA, 1993); and
- (12) Environmental Protection Ordinances of Anhui Province (November 2010).

4.1.3 Related Planning and Documents on Environmental and Functional Zoning

- (1) Planning of the Wanjiang Urban Cluster Demonstration Regions for Transferred Industries (2009-2015);
- (2) Control and Detail Planning of XETDZ2 for Receiving Industries Transferred from the East in Xuancheng Anhui Province) (by Anhui Urban & Rural Planning and Design Institute, October 2011);
- (3) Xuancheng Urban Master Plan (2007–2020) (November 2008);
- (4) Land Use Master Plan of Xuancheng (2007-2020) (May 2011);
- (5) The 12th Five Year Planning Compendium of National Economy and Social Development of Anhui Province (March 2011);
- (6) The 12th Five Year Planning Compendium of National Economy and Social Development of Xuancheng (March 2011);
- (7) Control and Detail Planning of the Starter Zone in West Xuancheng (2008-2020);
- (8) Master Plan of Jingting Mount Scenic Area (2008-2020);
- (9) Water and Functional Zoning of Xuancheng (January 2010);
- (10) Planning of Municipal Drainage Facilities of Xuancheng (2007-2020);
- (11) Planning of Municipal Water Supply Facilities of Xuancheng (2007-2020);
- (12) Report to Justify the Location of the XETDZ WWTP (of Changqiao River Basin) by the Xuancheng Planning and Design Research Institute (September 2011);
- (13) The 12th Five Year Plan of Environmental Protection of Xuancheng (March 2012);
- (14) Report on Strategic EIA of XETDZ2 for Receiving Industries Transferred from the East in Xuancheng Anhui (November 2011);
- (15) Implementation Method of Resettlement Compensation for Demolition and Relocation of Buildings within Collective Land being Acquired due to Near Term Urban Development in Xuancheng (August 2009); and
- (16) Circulation on Adjustment to and Issues of Policies for Resettlement Compensation and Social Security regarding Acquisition of Collective Land and Demolition of Buildings thereof due to Near-Term Urban Development (March 2010).

4.1.4 Technical Guidelines and Codes of EIA

- (1) Technical Guidelines for Environmental Impact Assessment-General programme (HJ2.1-2011), January 2012;
- (2) Technical Guidelines for Environmental Impact Assessment-Surface Waters (HJ/T2.3-93), September 1993;
- (3) Technical Guidelines for Environmental Impact Assessment-Atmospheric Environment (HJ/T2.2-2008), April 2008;
- (4) Technical Guidelines for Environmental Impact Assessment-Acoustic Environment (HJ/T2.4-1995), November 1995;
- (5) Technical Guidelines for Environmental Impact Assessment-Ecological Impacts (HJT19-2011), September 1, 2011;
- (6) Technical Guidelines for Environmental Impact Assessment-Ground Water (HJ610-2011), June 1, 2011; and
- (7) Technical Guidelines for Environmental Risk Assessment on Development Projects (HJ/T 169-2004), December 11, 2004.
- (8) Municipal Land Use Categorization and Planning Construction Land Use Standards

(GB50137-2011), January 1, 2012

4.2 The Bank's Safeguard Policies

4.2.1 Bank Safeguard Policies and Compliance

Among the Bank's 10 Safeguard Policies, two, i.e., the OP/BP4.01, Environmental Assessment, and OP/BP4.12 Involuntary Resettlement are triggered. The Project is in compliance with these two policies. Meanwhile, the Project is in compliance with Bank policies and requirements regarding disclosure of project information. See Table 2-1 for the compliance with the Bank's safeguard policies.

Table 2-1 Compliance with Bank's Safeguard Policies

Safeguard Policies	Triggered by the Project	Status of Compliance
OP/BP 4.01 Environmental Assessment	Yes	Category A project. A full EIA and EMP are prepared; two rounds of public consultation have been carried out as part of the EIA procedure.
OP/BP 4.04 Natural Habitats	No	The Project does not involve any natural habitats
OP/BP 4.36 Forestry	No	The Project would not finance any activity that may involve a major change or degradation of the important forest area or related major natural habitat as defined in the Policy.
OP/BP 4.09 Pest Management	No	The Project would incur neither purchase of any pesticide nor additional pesticide application. No action is required according to the Policy.
OP/BP 4.11 Physical Cultural Resources	No	Not any cultural heritage or other physical cultural resource has been found. Chance-find procedure is included in the EMP.
OP/BP 4.37 Safety of Dams	No	There is no dam in the project area.
OP 4.10 Indigenous Peoples	No	No indigenous people live in the Project area. Nor will the Project impose impact to any indigenous people.
OP/BP 4.12 Involuntary Resettlement	Yes	A Resettlement Action Plan is prepared.
OP/BP 7.50 Projects on International Waterways	No	There is no international waterway involved in the project area.
OP/BP 7.60 Projects on dissentient Region	No	There is no dissentient region involved in the project area.

4.2.2 World Bank EHS Guidelines Compliance

The World Bank Group Environmental, Health, and Safety Guidelines (the General EHS Guidelines), section on wastewater treatment of the Environmental, Health, and Safety Guidelines for Water and Sanitation, the Environmental, Health, and Safety Guidelines for Toll Roads, the Environmental, Health, and Safety Guidelines for Gas Distribution Systems, section on waste collection and transport

of the Environmental, Health, and Safety Guidelines for Waste Management Facilities are also applicable to the Project. The mitigation measures included in the Project Environmental Management Plan are fully consistent with the requirements of the above EHS Guidelines (especially the provisions on construction management). It is noteworthy that what the EHS Guidelines recommend is largely consistent with the China laws, regulations, guidelines, and construction management rules.

Table 2-2 Compliance with World Bank Group EHS Guidelines

WBG EHS Guideline	Compliance of EIA/EMP
If the facility or project is close to an identified ecologically sensitive area (such as a national park), it shall minimize the increase in pollution levels whenever and wherever feasible. In addition, appropriate mitigation measures may also include the use of clean fuels or technologies, and application of comprehensive pollution control measures.	XETDZ2 is close to the Jingting Mountain Scenic Area. Development and operation of the gas supply utilities in the Zone will make natural gas available to the industries and tend to result in much less emission of air pollutants.
Dust or particulate matter (PM) is the most common pollutants of unorganized emissions. Certain operations (such as transport and open-air storage of solid materials) and bare soil surface (including unpaved road) will release particulate matter.	Dust-control methods, such as coverage, sprinkling for dust suppression or moderate wetting of the materials in open-air stack will be applied during the construction period. Sprinkling and suppression will be applied to transport of materials on paved or unpaved roads.
No industrial waste water, domestic wastewater, wastewater from operations of public works or stormwater shall be discharged into a public or private wastewater treatment system unless it meets the pretreatment and monitoring requirements of the wastewater treatment system it is to enter.	In XETDZ2, the industrial wastewater is not allowed to enter the wastewater treatment plant unless it is subjected to a pretreatment and meets the Level 3 discharge limits of the Comprehensive Wastewater Discharge Standards (GB8978-1996).
Storm water shall be separated from process wastewater and domestic wastewater in order to reduce the wastewater generation that needs treatment before emission.	Separate storm water drainage and wastewater systems are applied in XETDZ2, and separate storm sewers and wastewater collectors will be developed.
Environmental, Health, and Safety Guidelines for Water and Sanitation	Compliance of EIA/EMP
Noise prevention and control measures shall be applied if the projected noise level at the most sensitive receiving point due to the operation of project facilities or operation activities will exceed the noise limits.	Low sound and power level equipment will be selected. Vibration isolation will be installed for machinery and equipment. Running time of certain equipment or operation will be limited, particularly for those mobile noise sources that will move in a community.
Carry out design, construction, operation and maintenance of a wastewater treatment plant, so that the treated effluent can meet relevant national requirements or internationally	The Changqiao Wastewater Treatment Plant refers to the Level 1-A discharge standards of the Pollutant Discharge Standards of Municipal Wastewater Treatment Plant (GB18918-2002)

accepted standards.	for compliant effluent discharge.
Odor from the treatment plant will interfere with the WWTP staff and the surrounding community. Measures to prevent reduce and control air emissions and odor are suggested.	Coarse screen, influent pumping station, and sludge thickening tank may be designed as enclosed chambers with covers at the top to constrain the odor diffusion space. For the sludge dewatering room that is of bigger space, odor will be collected for concentrated and biological treatment. Vegetation consisting of tall trees that are strongly pollution resistant and capable of absorbing harmful gases will be provided around the WWTP boundary to serve as isolation buffer and play absorption function. Health protection distance will be established. No residential development, schools or other development of concentrated human activities shall be planned within the 100 m of the WWTP site, especially in areas at its downwind direction.
Sludge treatment and utilization. After stabilization, the sludge may be dewatered for either disposal at the landfill or incineration, or further processing to be conducive for re-use.	Sludge will be dewatered by mechanical belt press and the dewatered sludge will be transferred to the Xuancheng sanitary landfill for disposal.
Environmental, Health, and Safety Guidelines for Toll Roads	Compliance of EIA/EMP
Siting roads and support facilities to avoid critical terrestrial and aquatic habitat (e.g. old-growth forests, wetlands, and fish spawning habitat) utilizing existing transport corridors whenever possible;	The area where the Project is located is no part of a critical terrestrial and/or aquatic habitat.
Minimizing removal of native plant species, and replanting of native plant species in disturbed areas;	A water and soil conservation plan has been specially prepared. Native plant species as appropriate will be planted according to the water and soil conservation plan.
Paving in dry weather to prevent runoff of asphalt or cement materials;	Paving works are prohibited in windy weather and working sites will be laid out in a proper manner.
Where significant oil and grease is expected, using oil /water separators in the treatment activities;	Vessels of oily wastewater from construction equipment will be provided on the working sites for collecting the oily wastewater to be generated. The collected oily wastewater will be delivered to a facility with the treatment capacity for treatment. Direct discharge is prohibited.
Avoiding the generation of contaminated runoff	The technical specifications of works as part of

<p>from cleaning of asphalt equipment by substituting diesel with vegetable oil as a release and cleaning agent; containing cleaning products and contaminated asphalt residues; scraping before cleaning; and conducting cleaning activities away from surface water features or drainage structures.</p>	<p>a civil works contract of the Project will include special requirements on the storage of fuel, oil/grease, and other hazardous or toxic matter, and that all the fuel materials on the working sites be fenced for storage; the space for storage be 110% of volume of the fuel storage vessels. Fuel storage sites are not to be located near any source waters (i.e., within 100m from the source water);</p>
<p>Insulation of nearby building structures (typically consisting of window replacements); Use of road surfaces that generate less pavement / tire noise such as stone-matrix asphalt</p>	<p>There shall be restricting provisions on the functions of the areas along the arterial roadways during the operation period of the Project. Roadside buildings shall be installed with sound-proof windows as appropriate. Asphaltic pavement is designed for all the road subcomponents of the Project.</p>
<p>Environmental, Health, and Safety Guidelines for Gas Distribution Systems</p>	<p>Compliance of EIA/EMP</p>
<p>To prevent and control impacts to aquatic habitats, distribution pipeline rights-of-way should be sited to avoid critical aquatic habitat such as watercourses, wetlands, and riparian areas, as well as fish spawning habitat, and critical fish over-wintering habitat, whenever possible. Use of guided / directional drilling for distribution pipeline installation should be considered where feasible to reduce impacts to both terrestrial and aquatic habitats.</p>	<p>There is no critical aquatic habitat in the Project area. Use of guided / directional drilling for distribution pipeline installation has been considered in the engineering design of the Project.</p>
<p>Identification and location of existing gas and other buried utility infrastructure prior to excavation for installation or repair of gas pipelines. Installation of visual marking of gas lines as part of installation, and updating as necessary on an ongoing basis;</p>	<p>There have been so far no industrial development activities and therefore no gas and other buried utility infrastructure in the Project area. With respect to the gas pipelines, preventive and precaution measures against accidents are recommended in the EIA respectively for the design, construction and operation of the Project.</p>
<p>The presence of gas distribution systems within populated areas may expose the public to hazards from gas leaks and explosions. Gas leakage may result from accidental rupture of pipelines during installation and repair or from contact during excavation unrelated to the gas system. Gas utility operators should inform and advise affected communities, schools, businesses / commercial facilities, and residents about the potential hazards presented by gas</p>	<p>Preventive and precaution measures against accidents are recommended in the EIA respectively for the design, construction and operation of the Project, and emergency plan is developed accordingly.</p>

<p>infrastructure. Gas distribution system operators should establish an emergency preparedness and response plan and communicate this plan to the public as necessary.</p>	
<p>Environmental, Health, and Safety Guidelines for Waste Management Facilities</p>	<p>Compliance of EIA/EMP</p>
<p>Waste Collection and Transport</p>	
<p>Encourage use of containers or bags for waste at the point of collection for each household and establishment; Implement a regular collection schedule with sufficient frequency to avoid accumulation of garbage; Cover collection and transfer vehicles along the entire route of transport to avoid windblown litter;</p>	<p>As part of the Project, 143 waste drop-off points are to be provided, and two 204-L waste bins will be provided at each of the drop-off points to receive respectively refuse that is recyclable and not recyclable. In addition, refuse trucks with hanging bins are included for emptying the waste bins and collecting and transporting the refuse twice per day. For this purpose, four(4) refuse trucks, each with 20m³ container, are proposed, and four(4) transfer stations, each with daily handling capacity of 30 tons, are designed to provide a total handling capacity of 120 tons/day. Local sanitation department will be operating the equipment and facilities to collect and transport the refuse to the Xuancheng sanitation landfill.</p>
<p>Establishing frequent waste collection schedules; Instituting a washing program for waste collection vehicles and for company-owned waste collection and transfer containers; Promoting the use of bags to reduce the odors from soiling of waste collection and transport equipment.</p>	
<p>Optimize waste collection routes to minimize distance traveled and overall fuel use and emissions; Implement transfer stations for small vehicles to consolidate waste into large vehicles for transportation to a treatment or disposal facility;</p>	

Domestic Laws and Regulations

Preparation of the EA documents is in full accordance with the above laws, regulations and guidelines. Compliance with key domestic laws and regulations associated with the Project are summarized in Table 2-3.

Table 2-3 Compliance with China Laws and Regulations

China's Laws And Regulations	Compliance of the Project
Environmental Impact Assessment Law	<ul style="list-style-type: none"> The full EIA report was prepared by a certified EIA consultant and the project implementation unit, and has been approved by the Anhui Provincial Environmental Protection Department. Two rounds of public consultation have been carried out.
Circulation to Strengthen EIA Management of IFI Financed Development Projects	<ul style="list-style-type: none"> The EIA report and Environmental Management Plan are in line with the Bank's safeguard policy.
Land Administration Law	<ul style="list-style-type: none"> The land of XETDZ2 is of development land use and the nature is in line with Xuancheng's urban land use master plan (2006-2020).
Water Pollution and Control Law	<ul style="list-style-type: none"> XETDZ2 will be developed with such sewer networks as to enable centralized wastewater treatment. The wastewater treatment plant outfall is not located in a surface water source reserve.
Water Conservation Law	<ul style="list-style-type: none"> A soil and water conservation program is prepared, and submitted to the Xuancheng Water Authority for approval. Erosion prevention and control measures will be carried out in accordance with the approved soil and water conservation program. Building activities in the abandoned sand, stone, soil, etc. stacked in the spoil ground water and soil conservation program, and to take measures to ensure that no new hazards. The preparation of the soil erosion monitoring program, and will monitor the situation on a regular basis reported Xuancheng City Water Authority.
Cultural Heritage Conservation Law	<ul style="list-style-type: none"> During the construction of the Project, in the event of a cultural heritage site being found by any entity or individual, the site shall be protected and the issue shall be immediately reported to the local cultural heritage administrative department.

Industry Relocation and Environmental Management

By nature the project context is the incremental industrial growth and expansion from eastern coastal area to hinterland of China. The project aims to build an infrastructure platform to receive the industrial expansion in Xuancheng which holds an exceptional geographical location to meet the objective. Compared to neighboring Jaingsu and Zhejiang provinces, Xuancheng enjoys relatively abundant and cheaper land and human capital, and good quality environmental resources. Therefore, it is more precise to consider the project an industrial expansion project.

It is possible that a few factories would close its original plants and move to XEDTZ2. The closing, equipment decommissioning and relocation shall comply with national and local regulations. And the XEDTZ shall put their compliance as screening criteria before receiving the enterprises.

A policy analysis was carried out to study Chinese national regulations in terms of solid waste management, contaminated site clean-up. Such regulations in Zhejiang, Jiangsu, Shanghai and Guangdong have been examined as well. Based on the review, it is clear that a “polluters pay” principle is applied to address the issue. Local governments are responsible for supervision and enforcement in this regard. Therefore, local environmental authorizes take the responsibility of the industry relocation and legacy issues under its jurisdiction. Original plant owner shall be responsible for remediate environmental impacts such as contaminated soils following relevant regulations and technical standards.

The XEDTZ2 land use pattern has been determined as Category 1 and 2 industrial land use, meaning from legal perspective heavy pollution industries such as refinery, chemical are not allowed to enter XEDTZ2. Overall, when screening new enterprises, XEDTZ will strictly follow land use plan and SEA requirements to carefully select and conduct due diligence of incoming enterprises. Environmental issues, if any, associated with the relocation process will need to be identified and incorporated into the screening criteria.

5 Environmental and Social Baselines

3.1. Environmental Characteristics of XETDZ2

The XETDZ2 is located in the northwest of Xuancheng City with a floor area of about 25 km². Its landforms are mainly downland and plan and the land use types are mainly farmland, tea garden, idle land and a few residential lands.

The XETDZ2 is characterized by the following:

- Typical agricultural area;
- Good water, power and gas supply and convenient transportation;
- Good environmental quality and considerable environmental assimilation capacity;
- The XETDZ2 scale and needed infrastructures are expanding rapidly and will be increased quickly.

3.2.Resource and Environment Limit

The XETDZ2 is identified to have the following resource and environment limitation factors.

- The land resources available for development in Xuancheng City are limited. Concentrated infrastructure and industrial development in the XETDZ2, which is an efficient way in terms of land use and conducive to environmental management.
- Xuancheng belongs to acid rain control area. Coal-based energy use therefore shall be limited in order to reduce impacts to ambient air quality.
- In the vicinity of XETDZ2 there is a Jingting Mountain Scenic Area which requires limiting air emissions from industries.

3.3 Functional Zoning of Regional Environment

1. Surface water

Zhouhan River, Qingyijiang River, Changqiao River and Xijing River are subject to water quality standard Class III in Environmental Quality Standard for Surface Water (GB3838—2002).

Table 3-1 Environmental quality standards for surface waters in mg/L except for pH

Item	Standard of Class III Water Quality
pH	6~9
COD	≤ 20
BOD ₅	≤ 4
NH ₃ -N	≤ 1.0
TP	≤ 0.2
Zn	≤ 1.0
As	≤ 0.05
Hg	≤ 0.0001
TN	≤ 1.0
Cr ⁶⁺	≤ 0.05
Cd	≤ 0.005
Pb	≤ 0.05
e.coli	≤ 10000
Cyanide	≤ 0.2

Item	Standard of Class III Water Quality	
Volatile phenol	≤	0.005
Petroleum	≤	0.05

Note: Class I is mainly for source water and water bodies at national natural reserves;

Class II is mainly for sources of water intake with class I protection for collective and domestic drinking water use, habitats of rare aquatic organisms, fish and shrimp cultivation areas, bait area of larval and juvenile fish, etc.;

Class III is mainly for sources of water intake with class II protection for collective and domestic drinking water use, fish and shrimp wintering grounds, migration routes, aquaculture areas and other fishery waters as well as swimming area;

Class IV is mainly for general industrial water use and recreational water use areas that are no in contact with human body; and

Class V is mainly for agriculture water use areas and water bodies for general landscaping water use.

2. Ambient air

Air quality in the XETDZ2 area is subject to Ambient Air Quality Standard GB3095-1996 Grade II; The air quality of Jingtingshan Scenic Spot is subject to Ambient Air Quality Standard GB3095-1996 Grade I.

Table 3-2 Ambient Air Quality Standards

Pollutants	Valuation	Level 1 Value (mg/m ³)	Level 2 Value (mg/m ³)	Ref. Standards
SO ₂	Annual average	0.02	0.06	Ambient Air Quality Standards, GB3095-1996 and the list of revision in 2000
	Daily average	0.05	0.15	
	hourly average	0.15	0.50	
TSP	Annual average	0.08	0.20	
	Daily average	0.12	0.30	
PM ₁₀	Annual average	0.04	0.10	
	Daily average	0.05	0.15	
NO ₂	Annual average	0.04	0.08	
	Daily average	0.08	0.12	
	hourly average	0.12	0.24	
CO	Daily average	4.00	4.0	
	hourly average	10.00	10.0	
Ammonia	Once	0.2	0.2	Health Standards for Design of Industries, TJ36-79
H ₂ S	Once	/	0.01	
Non-methane hydrocarbon (NMHC)	Daily average	/	2.0	Israeli Standards
	hourly average	/	5.0	

Note: Functional zones of category I type of ambient air quality (category I zones) refer to natural reserves, scenic areas and other areas that need special protection.

Functional zones of category II type of ambient air quality (category II zones) refer to the residential neighborhood, mixed areas of commercial, transport and residential land use, general industrial zones and rural areas identified in the urban and town planning and areas that are not part of either category I or III zones.

Functional zones of category III type of ambient air quality (category III zones) refer to special industrial zones.

3. Acoustic environment

The industrial land in the assessment area is subject to Noise Environment Quality Standard (GB3096-2008) Class 3, areas on both sides of arterial traffic are subject to Class 4a of the Standard and other areas subject to Class 2.

Table 3-3 Limits of Ambient Noise, in dB(A)

Location	Daytime in dB(A)	Nighttime in dB(A)	Effective Standards
Residential neighborhood	60	50	GB3096-2008, category 2
Industrial estate	65	55	GB3096-2008, category 3
Both sides of main roads	70	55	GB3096-2008, 4a

Note: Functional zones of category 1 acoustic environment refer to residence, hospitals and health services, schools and education services, research and design services, administration and office areas that need quiet surroundings.

Functional zones of category 2 acoustic environment refer to areas dominated by commercial, financial, trading and market activities, or those with mix land use of residential, commercial and industrial purpose but are in need of peacefulness for residential buildings.

Functional zones of category 3 acoustic environment refer to areas dominated by industrial operation, storage and logistic activities, where such industrial noise that may have severe impact to the surroundings shall be prevented.

Functional zones of category 4 acoustic environment refer to areas within certain distances from both sides of the main roads, which consist of two categories, 4a and 4b. Category 4a refers to areas on both sides of expressways, and primary and secondary highways, urban expressways, urban primary and secondary roads, urban rails (at grade), and inter waterway. Category 4b refers to areas on both sides of inter-city and regional railways (of trunk lines).

4. Soil

The soil environment is subject to Soil Environment Quality Standard GB15618-1995 Grade II.

Table 3-4 Limits of Standards for Soil and Sediment in mg/kg

standards	pH	Cd	Ni	Hg	Pb	As	Cu	Zn	Cr
GB15618-1995, level 2	<6.5	0.30	40	0.30	250	30 for rice paddy; 40 for dry land	50 for farmland, etc; 150 for orchard	200	250 for rice paddy; 150 for dry land
	6.5~7.5	0.30	50	0.50	300	25 for rice paddy; 30 for dry land	100 for farmland, etc; 200 for orchard	250	300 for rice paddy; 200 for dry land
	>7.5	0.60	60	1.0	350	20 for rice paddy; 25 for dry land	100 for farmland, etc; 200 for orchard	300	350 for rice paddy; 250 for dry land

Note: Category I is mainly for soils of national natural reserves (except for that where original background value is high for heavy metals), water source site for collective and domestic drinking water use, tea garden, pasture and other reserves. Soil largely maintains its natural and background values. For category I of soil, level 2 standards are applied.

Category II is mainly for soils of general farmland, vegetable fields, tea garden and orchard. Soil largely has no harmful effect and is free of pollution to vegetation and environment. For category II of soil, level 2 standards are applied.

Category III is mainly for soil of forest land and that with high pollutant tolerating capacity, farmland soil near mining fields (except for vegetable fields. Soil largely has no harmful effect or pollution to vegetation and environment. For category III of soil, level 2 standards are applied

5. Groundwater

The groundwater is subject to Underground Water Quality Standard GB/T14848-93 Class III.

**Table 3-5 Limits of Required Groundwater Quality
 in mg/L except for pH**

	Item or Pollutant	Category III Limit
1	pH	6.5~8.5
2	Total hardness (in CaCO ₃)	≤450
3	Total dissolved solids	≤1000
4	Chloride	≤250
5	Permanganate index (CODMn)	≤3.0
6	Ammonia nitrogen (NH ₄)	≤0.2
7	Mercury (Hg)	≤0.001
8	Arsenic (As)	≤0.05
9	Cadmium (Cd)	≤0.01
10	Chrome (hexavalence)(Cr ⁶⁺)	≤0.05
11	Lead (Pb)	≤0.05

Note: Category I is to reflect natural and low background contents of the chemical ingredients of the ground water, applicable for all purposes.

Category II is to reflect natural background contents of the chemical ingredients of the ground water, applicable for all purposes.

Category III takes the baseline values that assure human health as the limits, which are applicable to source water for collective and domestic water use and industrial and agricultural water use.

Category IV is to meet agricultural and industrial water use requirements. Besides being suitable for agricultural and part of the industrial water use, it may be used for domestic and drinking water after proper treatment.

Category V is not appropriate for drinking use. For other water use, it may be selected per the purpose.

6. Sensitive Areas

Jingting Mountain Scenic Area, which has an area of 2009 ha., in which the forestry land is 1402 ha, including woodland 1148 ha, bush land 216 ha with forest coverage of 67.9% and forestry land greening rate 97.3% and the vegetations belong to subtropical evergreen and broadleaved deciduous forest vegetation belts, which are all artificial spruces, masson pines and camphorwood; in addition, there are also economic trees such as tea, pear, peach, plum and Chinese chestnut trees.

The XETDZ2 is far away from the core area of Jingting Mountain Scenic Area, beyond the coordinative protection range of peripheral environment of Jingting Mountain Scenic Area and is about 400 m away from its nearest place, which meets the protection requirements of the Scenic Area.

3.4 Environmental Quality

During environmental assessment, the ambient air, surface water, groundwater, noise, sediments, river course bottom mud and soil environment quality of the XETDZ2 were sampled and tested to determine the current situation of environmental quality in the Project area. The result shows that the regional environment is in good condition and conforms to relevant Chinese quality standards. These results are basically consistent with the environmental quality monitoring result of planning environment assessment carried out previously.

6 Environment Management Roles and Responsibilities

4.1. Agencies and Institutions Involved in the Environmental Management

The implementation of this EMP requires the involvement of several agencies and institutions, each fulfilling a different but vital role to ensure effective environmental management for the Project.

Essentially there are two groups of institutions involved in the process of environmental management: those responsible for organizing or implementing the EMP, and those that enforce the standards, laws and regulations relevant to the project, supervise the EMP and the overall environmental performance during the construction and operation of the Project. The EMP institutional structure for Project construction is shown in **Error! Reference source not found.4-1**.

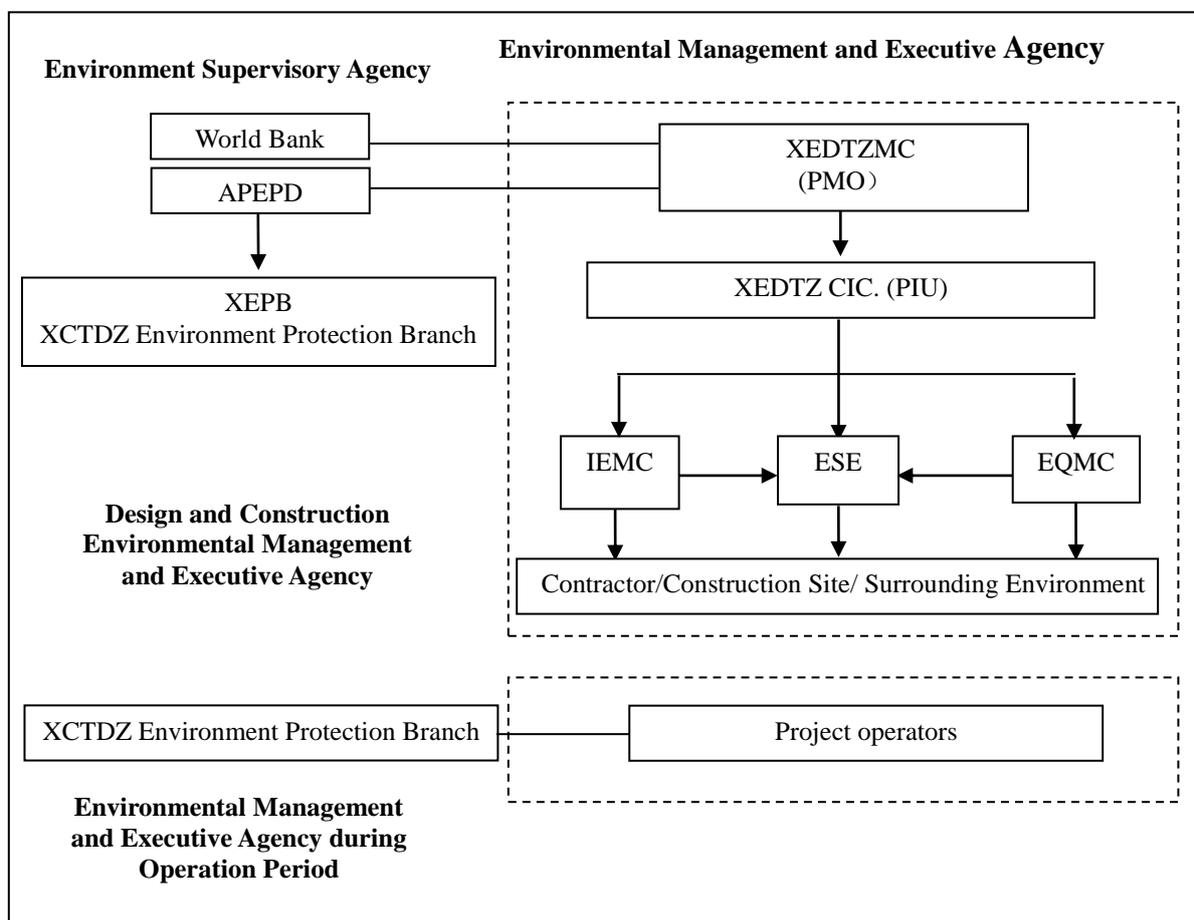


Figure 4-1 Environmental Management Institutional Structure

The main environmental responsibilities of the respective institutions are summarized in Table 3 .

Table4-1 Summary of Environmental Management Responsibilities

No	Agency/Unit	Responsibilities
1	Xuancheng Economic and Technological Zone Management Committee (XETTDZMC/PMO)	The XETDZMC will take the overall responsibility for the management and coordination of project implementation. Its WB Financed Environmental Supervision Office (PMO) handles the day-to-day management and coordination of project implementation. It will oversee the implementation of the Project and fulfill the requirements of World Bank.
2	Anhui Provincial Environmental Protection Department (APEPD)	The APEPD reviewed and approved the Project EA. It will be responsible for the enforcement of the laws, regulations, technical guidelines, and environmental quality standards during the Project construction and operation.
3	Xuancheng Municipal Environmental Protection Bureau (EPB) and XEDTZ EPB	XETDZ EPB being affiliated with the Xuancheng EPB, is a field office of Xuancheng EPB, which is responsible for carrying out environmental management and supervision duties within the XETDZ jurisdiction. On behalf of the APEPD, the EPBs will carry out environmental monitoring, supervision and enforcement during project construction and operation, deals with public complaint, ensure “three simultaneous” and proper operation of environmental protection facilities.
4	XEDTZ Construction Investment Company (CIC/PIU)	The CTC, a subsidiary agency of XETDZ, will implement above infrastructure construction engineering, including the procurement, construction management, safeguard policy implementation and compliance, as well as the monitoring, reporting tasks under the Project.
5	Environmental Supervision Engineer (ESE)	The ESE are responsible for inspecting, supervising, and auditing all construction works and other activities undertaken by the Contractor(s), to ensuring compliance with the environmental protection requirements and contractual requirements.
6	Contractor(s)	Contractor(s) is hired by the Project Owner to undertake the detailed design and the construction activities for the Project.
7	Project operators	Operation of the environmental facilities and environmental management during the operation period.
8	Independent Environmental Management Consultant (IEMC)	The IEMC is hired by the Project Owner and is independent of the ESE and Contractor. The objectives of the IEC assignment is to assess the implementation and performance of the Project EMP during construction, provide management recommendation to the Project owner, and eventually ensure the Project compliance with the EMP.
9	Environmental Quality Monitoring Consultant (EQMC)	The EQMC refers to specialized monitoring institutes who will conduct environmental quality monitoring according to the environmental monitoring plan included in the EIA reports. The Project Owner will employ EMS to implement the monitoring plan.

4.2. Environmental Management Responsibilities During Construction

● *XETDZMC(PMO) and CIC(PIU)*

The XETDZMC, as **the project owner**, will take the overall responsibility for the project implementation and coordination. The CIC is implementation agency for the Project. It is responsible for day-to-day management of project implementation, including EMP implementation supervision and compliance. The CIC’s environmental management responsibilities include, but not limited to, the following aspects.

- 1) Supervise the implementation of mitigation measures and other environmental protection measures during project construction, including incorporation of the measures into the bidding documents and contracts, organizing training for the contractors, enforce other environmental management plan and conduct periodically inspection on the construction sites.
- 2) Engage and supervise environmental monitoring consultant (for example, IEMC and EQMC) to carry out environmental monitoring in accordance with the project environmental monitoring plan.
- 3) Engage and supervise the IEMC to provide technical support including management advice, training, periodical field inspection, and preparation of reports.
- 4) Field investigation and write reports

The CIC will appoint 1-2 dedicated environmental staff who will be responsible for overall coordination of the EMP implementation. The dedicated environmental staff must have adequate knowledge on environmental management as well as environmental legislation to can understand and implement the EMP. Their duties include the following:

- 1) Ensure the project environmental management is in compliance with the requirements of EMP and relevant legislation. Take appropriate measures if non-compliance is identified.
- 2) Maintain open and smooth communication between XETDZ, supervision engineers and contractors with regard to environmental issues.
- 3) Review and approve the site-specific Environmental Protection Implementation Plan prepared by Contractors, that may cause great environmental impacts due to key project activities. Organize regular site inspections of all construction areas according to the requirements of EMP.
- 4) Review and filing the reports related with environmental management complied by the contractor and ESE
- 5) Monthly reporting to XETDZMC on environmental issues of construction sites.

● ***Contractors***

The Contractor and its employees shall firstly at all times try to avoid the any negative impacts that may result from the project construction activities and secondly shall comply with the mitigation measures specified in the EMP and contracts to minimize harm and nuisances on the environment and local communities.

Remedial measures which cannot be effectively carried out during construction stage should be carried out on completion of the works and prior to issuance of the acceptance of completion of works.

The Contractor shall establish a robust environmental management system to meet the requirements of the institution, site-specific measures, monitoring, training and reporting requirements.

Detailed Environmental Specifications for Contractor(s) are included in Chapter 7.

● **Environmental Supervision Engineer (ESE)**

ESE is an integral part of Supervision Engineer's function. Each Supervision Engineer

company will assign at least one ESE to each contract/working group. The responsibilities of the ESE include:

- 1) Review and ensure the Contractor's construction organization plan in compliance with the requirements of EMP and project construction with regard to environmental protection and impact mitigation;
- 2) Review Contractor's site-specific Environmental Protection Implementation Plan and Environmental Protection Construction Organization Plan of the construction sites in view of key project activities with potential environmental impacts (if any), prior to the project owner's final review and approval.
- 3) Carry out day-to-day site inspection and ensure the Contractor's activities in compliance with EMP and other relevant regulations. Instruct the Contractor to take corrective actions within the ESE determined timeframe in case non-compliance or discrepancies identified.
- 4) Shall provide assistance to the XETDZ, as necessary, during the implementation of the environmental monitoring and supervision work. .
- 5) Regularly monitor the performance of the Contractor's environmental management system, including environmental staff, procedure and reporting. Verify and confirm environmental supervision procedures, parameters, monitoring locations, equipment and results. In case any discrepancies identified, the ESE will instruct the Contractor to take corrective actions, including capacity building and replacement of the Contractor's environmental staff.
- 6) Regularly prepare environmental supervision reports and submit to the XETDZMC for review and filing.
- 7) As a member of Supervision Engineer, approve invoices or payments according to the implementation and performance of EMP.

● ***Independent Environmental Management Consultant (IEMC)***

The XETDZ will engage an IEMC to provide technical support for environmental protection during the construction. The IEMC will be independent of the ESE and Contractors, and will directly report to XETDZ. The IEC shall be led by a person who can independently and professionally examine records, procedures and processes. He/she may require a small team to assist he/she with checking the sites (i.e. the IEMC team). The IEMC shall have extensive knowledge and experience in environmental monitoring and auditing to provide independent, objective and professional advice on the environmental performance of the Project (at least 5 years experience is required). The IEC shall familiarize himself with the project works through review of the reports, including EMP of the Project. In particular, the IES is expected to perform the following duties:

- 1) Review and audit in an independent, objective and professional manner in all aspects of the EMP;
- 2) Inspect and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and locations of sensitive receivers;
- 3) Carry out random sample check and review on monitoring data and sampling procedures, etc;
- 4) Conduct random site inspection;
- 5) Review the EIA recommendations and requirements according to the implementation of environmental protection measures;
- 6) Review the effectiveness of environmental mitigation measures and project environmental performance;

- 7) Inspect and certify the environmental acceptability on the construction method, relevant design plan and documents for application according to the need. Where necessary, the IEC shall seek the least impact alternatives in consultation with the designer, the Contractor(s) and XCTDZ;
- 8) Inspect the investigation results of any non-compliance of the environmental
- 9) Quality performance and the effectiveness of corrective measures;
- 10) Feedback audit results to XETDZ and ESE team according to the procedures of non-compliance in EMP, and provide Supervision Engineer (ESE) suggestions on actions of penalty, suspension of works or other punishment;
- 11) Provide environmental training to the Contractors, ESE and XETDZ's staff prior to Project started and during construction;
- 12) Help prepare semi-annual environmental monitoring report to the XETDZ and the World Bank.

Textbox 1 Terms of Reference for IEMC

Terms of Reference for IEMC

The tasks outlined below is designed to assess the implementation of EMP of the Project during construction, provide the maangemetn recommendation to the Project owner and ensure the requirements of the Project compliance with EMP.

Task 1 – Review the Project Documents

The IEMC is expected to review the project EIA, EMP, RAP and relevant regulations. A work plan shall be prepared based on the review and submitted to the project owner for examination and approval.

Task 2 – Provide EMP Training

Prior to the construction is started, the IEMC will prepare training materials based on the EMP and provide training to the Project owner, contractor and supervision engineer. During the Project implementation, the EEC will carry out such EMP training according to the actual needs (at least one time a year).

Task 3 – Field Visit and Supervision

- 1) Prior to the construction is started, the IEMC will assist the Project owner to checking the environmental protection methods in the constructor's construction plan and providing comments as appropriate.
- 2) During construction, carry out regular field visit to the Project site. During the field visit, the IEMC will check the documents related to environmental management such as

construction environmental protection plan, environmental monthly report; check the implementation of institution, staffing arrangement and mitigation measures. Provide corrective recommendations according to the non-compliance behavior and promote good practices;

- 3) Visit the crowd affected and provide management recommendations to the Project owner; and
- 4) Identify environmental issues that may not be identified during the Project preparation stage, and provide recommendations on alternatives and/or mitigation measures to the Project owner.

Task 4 – Environmental Monitoring

The Project owner will engage an environmental quality monitoring consultant to carry out monitoring during construction. The IEMC is expected to prepare the terms of reference for the monitoring based on EMP requirements, assist in the implementation of monitoring, review the monitoring results and report to the project owner.

Task 5– Reporting

During the Project implementation, assist in the Project owner to prepare semiannual environmental monitoring and supervision report and submit to the XETDZ, AEPD and the World Bank.

● ***Environmental Quality Monitoring Consultant (EQMC)***

In order to closely monitor the environmental quality in the Project area and minimize environmental impacts during construction and operational stage, the XETDZ will engage specialized environmental monitoring consultants to implement the environmental monitoring plan developed during EA stage. The responsibilities of the EQMC include:

- 1) Familiar with the Project works and the EMP, particularly the environmental monitoring plan;
- 2) Carry out the environmental monitoring timely and in a professional manner in accordance with the environmental monitoring plan;
- 3) Inspect and confirm the accuracy of monitoring results, monitoring equipment, monitoring locations, monitoring procedures and locations of sensitive receptors;
- 4) Submit the monitoring results and recommendations to XETDZ in time.

4.3. Management of Contractor(s)

The project contractor will be a key component in environmental management, pollution

control and impact mitigation. During the construction period, the contractor shall always station in the construction site, who shall be mainly responsible for effective controlling and reducing the impact on the environmental. Most of the environmental protection measures shall be implemented by the contractor. In order to ensure the contractor implement the relative environmental protection measures and EMP, the following measures shall be taken:

- 1) During pre-qualification, the environmental management shall be included in the authentication clause when the contractor's qualification is reviewed. Under the same condition, it shall be given priority to the bidders who have passed the ISO9000 and ISO14000 authentication;
- 2) In preparation the bidding document, the Project owner shall ensure mitigation measures included in the EMP are fully incorporated in the relevant clause, and require the potential bidders to prepare the bids that fully cover the budgetary estimates for EMP implementation. Therefore, the implementation of the environmental protection measures will become the obligation and responsibility of the successful bidder;
- 3) Every Contractor will be required to provide at least one dedicated full time environmental staff on each section of the Project. In order to be qualified for the job, the environmental staff will receive an environmental training program first;
- 4) Prior to construction, the Contractor are required to submit site-specific Environmental Protection Implementation Plan and Environmental Protection Construction Organization Plan of construction sites in view of the key project activities with potential impacts (if any). The Plans shall be demonstrate compliance with the requirements of domestic environmental regulations and the mitigation measures contained in the EMP. The plans shall provide such details as commitment to environmental protection by the Contractor's project management team; the method of implementing the Project EMP; detailed designs and installation of anti-pollution facilities (e.g. drainage channel, settling tank, temporary noise reduction barrier, etc); environmental control mechanism; detailed earthworks management plans and site construction plans (show indetail that the measures are proposed to minimize mitigate and control method of all kinds of influence in construction period) as well as the environmental monitoring program for different construction stages.
- 5) Prior to the construction is started, the contractor shall receive adequate training on EMP and relevant regulations. Each section/sub-contractor and contractor shall appoint at least one project manager and one environmental engineer to join the training. In addition, the ESE shall also join the training.

4.4. Environmental Management Responsibilities during Operation Period

- **XETDZ EPB**

- (1) Being responsible for the supervision and implementation of the environmental management programs of the XETDZ;
- (2) Being responsible for the preparation and development of environmental related systems and policies in the XETDZ;
- (3) Being responsible for the environmental statistics, filing and registration of pollution sources, and reporting of the XETDZ;
- (4) Being responsible for the operation, repair and maintenance of the public environmental facilities

in the XETDZ to ensure normal and stable operation; and

- (5) Being responsible for supervision, investigation and processing any complaints to environmental disturbance during the project operation period to ensure implementation of the “three simultaneous systems” (i.e., environmental facilities associated with a development project are designed, built and operated simultaneously as part of the project as referred to elsewhere in the EIA) and normal operation of the environmental facilities.

- **Project Operators**

A special environmental management section will be established to be responsible for the implementation of the EMP during the project operation period. Detail responsibilities of the environmental management sections are,

- (1) management of the execution of the projection environmental protection measures;
- (2) coordination of environmental issues in collaboration with environmental supervision and management authority and local communities;
- (3) abiding the environmental monitoring program of the Project and hiring the Xuancheng EMC to carry out routine monitoring on the air and water pollutant emissions as well as the solid waste generation of the project facilities and the regional environmental quality of the project area in accordance with the frequencies and monitoring locations as required in the monitoring program;
- (4) emergency disposal to minimize environmental risks in the event of an environmental accident;
- (5) collecting the environmental-management related information of the industries for submission to the Xuancheng EPB and the PMO; and
- (6) recording, reduction and archiving the environmental management files of the industries.

7 Environmental Impact and Mitigation Measures

Based on the key findings of EIA, the highlighted environmental impacts and mitigation measures are summarized in the following sections. Table 5-1, Table 5-2, and Table 5-3 list the major activities and stages of the Project, potential environmental impacts identified, typical mitigation measures as well as implementation and monitoring responsibilities.

These mitigation measures are developed to address the identified impacts of design, construction and operation stages, in accordance with relevant national laws, regulations, guidelines and norms, as well as World Bank policies, (including the *Environment, Health and Safety General Guidelines* and specific *Guidelines for Water and Sanitation Environment, Health and Safety*, the *Environmental, Health, and Safety Guidelines for Toll Roads*, the *Environmental, Health, and Safety Guidelines for Gas Distribution Systems*, section on waste collection and transport of the *Environmental, Health, and Safety Guidelines for Waste Management Facilities*). The detailed management plan such as contractor specifications, soil and water conservation plan, contingency plan, XEDTZ2 cumulative environmental impact follow-up plan, and capacity building plan are further elaborated in the Chapter 7-11.

Table 5-1 Environmental impact and mitigation measures in design stage

Activity	Potential Impacts/Issues	Mitigation measures	Reference to EMP and RAP	Who Implement	Who Monitor	Monitoring indicator	Monitoring frequency
Land acquisition and resettlement	Resettlement impacts on original residents in the XETDZ2	Prepare resettlement action plan according to the national policies and policies of WB	RAP	Wuhan University	XETDZ, WB	The RAP shall be approved by WB	By appraisal
Social impacts	Temporary or permanent land take and resettlement; improper site selection of sediment/spoil disposal sites resulting impacts on surrounding sensitive receptors, etc.	<p>① It is required to consider comprehensively during project design, the project shall be designed according to the surrounding environment and it is required to further refine the permanent land occupation plan to use the land reasonably.</p> <p>② It is required to pay high attention to the crowd health during construction in design, the living conditions of temporary living area shall not be simple and crowded and meanwhile, it is required to select area with relatively good surrounding environment as the living area of construction personnel and prevent the transmission and spreading of infectious diseases.</p> <p>③ The bottom mud stacking yard shall avoid the surrounding density villages; the distance from the bottom mud stacking yard to the nearest village shall be controlled within above 50 m, which can effectively avoid the influence of bottom mud stink on the surrounding residents.</p> <p>④ Know the opinions and suggestions of public and all circles of the society by the Project construction influence prior to the Project development, in the process of and after the project construction through public participation to make the Project design to be more perfect.</p>	EMP Chapter 7	XETDZ, Design Institute	XETDZ, WB	The EIA shall be approved by WB and APEPD	By appraisal
Noise environment	Impacts on construction personnel	As the construction noise is relatively large in the process of building engineering and road engineering, it is required to take reasonable and effective noise isolation and reduction measures in project design to reduce and mitigate the influence of construction noise on the on-site construction personnel.	EMP Chapter 7	XETDZ, EA Consultant	XETDZ, APED	The EIA shall be approved by WB and APED	By appraisal
	Impacts of traffic noise on life of residents in the sensitive receptors along the roads	<p>① Conduct special design for the greening belt on both sides of the road;</p> <p>② provide ventilation and noise isolation window to the sensitive points on both sides of the road according to the</p>	EMP Chapter 7	EA Consultant	XETDZ, WB	The EIA shall be approved by WB and APED	By appraisal

		actual traffic and noise monitoring results.					
Atmospheric environment	Impacts on sensitive receptors along the roads	It is suggested that the planning department shall not add sensitive points within 80m on both sides of the road;	EMP Chapter 7	EA Consultant	XETDZ, WB	The EIA shall be approved by World Bank and APED	By appraisal
Ecological environment	Land occupation	It is required to consider comprehensively during project design, the project shall be designed according to the surrounding environment and it is required to further refine the permanent land occupation plan and use the land reasonably.	EMP Chapter 8	EA Consultant	XETDZ, WB	The EIA shall be approved by WB and APED	Prior to bid evaluation
	Soil erosion	Prepare water and soil conservation plan. The layout of water soil and preservation shall both fully take into account of the type, way and hazard degree of soil and water loss caused by the project and meanwhile shall be combined with the overall plan of management area in the project operation period.	EMP Chapter 8	EA Consultant	XETDZ, WB	The EIA shall be approved by WB and APED	By appraisal
	Influence of river course slag dumping yard	In the process of design, it is required to arrange the temporary sediments yard during construction and permanent disposal after construction reasonably according to the specific condition of different channels, establish flood prevention slag retention and waste prevention slag retention to centrally control the slag dumped and minimize the influence of stacking of dumped slag on the environment.	EMP Chapter 8	EA Consultant	XETDZ, WB	The EIA shall be approved by WB and APED	By appraisal
Contractor responsibility	Improper behavior may result in negative environmental impacts	An environmental specification for contractor has been prepared as part of the EMP and will be incorporated into bidding document and contracts	EMP chapter 6	EA Consultant	XETDZ, WB	The EIA shall be approved by WB, incorporated into bidding document and civil contract	By appraisal By bids awarding

Table 5-2 Environmental impact and mitigation measures during construction

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
Social environment	Traffic and traveling disturbance	<p>① Establish road diversion and temporary access plan and establish enough traffic diversion indication plates. It is required to make an announcement to reassure the public with radio, TV and newspaper in advance;</p> <p>② It is required to strengthen bridge construction management, especially the management of structures. Prior to construction, it is required to coordinate with relevant departments, arrange well construction time and vehicle passing time and set visible warning lamp on structure such as pier to remind the passing vehicles of safety;</p> <p>③ It is required to set warning lighting lamp in the construction road to lead the passing of vehicles.</p>	EMP Chapter 7	Contractor	ESE, IEMC	The ESE shall conduct on-site supervision; the regulations shall be complied with	Prior to construction
	Cultural relic protection	<p>According to the site investigation and upon consultation to relevant departments along the Project, no cultural relic or tombs will be impacted during construction.</p> <p>Chance-find procedure will be followed: in the process of construction, if new underground cultural relics are discovered, according to relevant laws and regulations on cultural relics, the construction unit shall protect well the site and notify the cultural relic management department in time for rescue and treatment to ensure the safety of cultural relics.</p>	EMP Chapter 7	Contractor	ESE, IEMC	Publication and training have been provided; cultural relic serendipitous record	Day-to-day
Acoustic environment	Noise	<p>① Equipment with high noise and vibration is strictly prohibited to work in rest time at noon or night, the construction unit shall select low-noise machinery and equipment or equipment with noise isolation and absorption device;</p> <p>② Arrange the construction time reasonably. Generally, noise in day time as a less influence on the daily life of residents, while the noise at night will influence</p>	EMP Chapter 6 and 7	Contractor	ESE, IEMC	Publication and training have been provided; the environmental monitoring proposal has been prepared	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>people's rest. So it is required to arrange the construction time reasonably to avoid construction within the rest time at night for rest of residents;</p> <p>③ Arrange construction place reasonably, the high-noise operation area shall be far from the noise-sensitive points; for some construction sites with serious influence, it is required to take temporary sound isolation enclosure structure and it is also possible to consider building temporary workshop on the side close to the sensitive point to replace the role of noise isolation wall. It is required to arrange more equipment to operate simultaneously as possible for the civil works to shorten the influence time. It is required to Relatively concentrate the fixed vibration sources on the construction site to reduce the range of vibration interference. Prior to construction surrounding the sensitive points such as school and residential area, it is required to take isolation reduction measures such as temporary noise barrier;</p> <p>④ The passing of construction transportation vehicles shall be arranged on the side away from sensitive areas such as residential area and school.</p> <p>⑤ According to the provisions of Regulations on prevention and control of environmental noise pollution of the PRC, if the specified limit is still not reached after noise-reduction measures are taken, the construction unit shall apologize and make compensation to the influenced organization or individual.</p>					
Surface Water environment	Impacts of river course improvement on surface water	<p>① Arrange the construction period reasonably, dredge the river course and build bridge in dry season and reduce the influence of suspended material increasing on river water quality caused by construction.</p> <p>② Excavate on the construction site to form temporary</p>	EMP Chapter 7	Contractor	ESE, IEM	The ESE shall conduct on-site supervision; the regulations shall be complied with;	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>sewage sedimentation tank. Waterproof cloth or plastic film can be used to prevent seepage. The sewage shall be drained to the sedimentation tank for static sedimentation for 2 h. After treatment, the sewage can be used for the re-washing of sand and stone or mixing of concrete. The residual sewage shall be drained to the river course after sedimentation. The slurry in the sedimentation tank may be used for the mixing of earthwork and stonework after natural dehydration through evaporation and drying in the interval time.</p> <p>③ The river course dredging shall be arranged in the low-water season. During construction, set up diversion channel to separate the construction area with river water. Prior to river course dredging, first dry the river bottom, which can reduce the pollution to water body during construction.</p> <p>④ The river water penetrating the dredging area will increase the sand content under the disturbance of excavator and increase the muddiness of water body. Such water can be stored in the dredging area temporarily and drained to the river course after sedimentation.</p> <p>⑤ The construction site shall be equipped with oily water collection container of construction machinery to collect the oily water generated. The oily water collected shall be sent to the unit with treatment ability for treatment and is prohibited to be discharged directly.</p> <p>⑥ The living area of construction personnel shall be arranged in the area with sewage pipes network and the domestic sewage shall be drained to the urban sewage pipes; when there is no sewage pipe network near the living area, it is required to build septic tank in the construction area use the domestic sewage for farmland</p>					

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		after collection and preliminary treatment. It is prohibited to directly drain the untreated domestic sewage in the river course.					
	Impacts of other construction activities on the surface water environment	<p>① The construction waste water may not be directly discharged to the water body. After sedimentation, the construction waste water may be discharged to the municipal sewage pipe network or drained externally with the surface runoff. The domestic sewage shall be drained to the urban sewer network or drained externally with surface runoff after pre-treatment via the sedimentation tank or septic tank. During construction, the domestic sewage is strictly prohibited to be drained to the surrounding water body without treatment.</p> <p>② The construction unit of this Project shall also conduct simple treatment of filtration and sedimentation to the slurry water, which is prohibited to be discharged externally. The construction unit shall strengthen management and ensure civilized construction.</p> <p>③ For the newly constructed project, the domestic sewage and washing waste water generated shall be centrally collected. Prior to the drainage pipe is laid, it shall be drained to the water body nearby with the surface runoff after pre-treatment via the sedimentation tank and septic tank; after the underground pipe network is laid, the waste water centrally collected shall be drained to the newly built drainage pipe network after pre-treatment via the sedimentation tank and finally drained to the municipal pipe network for treatment.</p> <p>④ The domestic garbage, construction garbage and repair garbage will cause pollution after they enter the water body, so all of them shall be recovered, classified, stored and treated. The available materials shall be used or submitted for purchase. For example, the residual</p>	EMP, Chapter 7	Contractor	ESE, IEMC	The ESE shall conduct on-site supervision; the regulations shall be complied with;	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>paper, wood, metal and glass garbage may be reused by the purchase station. Those unavailable shall be submitted to the sanitation department for innocent treatment, burning, landfill and stockpiling.</p> <p>⑤ The residual and waste oils during construction shall be collected, recovered and disposed with different containers respectively; the sand and stone washing water for roadbed construction and washing water for concrete mixing equipment shall be treated in the sedimentation tank first and the waste water shall be recovered for the construction site as far as possible and sprayed with water to reduce the raising dust;</p>					
Atmospheric environment	Impacts of river course rehabilitation on atmospheric environment	<p>① During excavation, it is required to keep the excavation face moist; in case of windy weather, it is required to avoid excavation; for the excavation area adjacent to the residential area, if the excavation face is dry, water spraying measures shall be taken to reduce raising dust.</p> <p>② When the wind speed is too high, it is required to stop construction and cover the stockpiling of easy-dusting materials.</p> <p>③ The vehicle loading may not too be full. Take covering and sealing measures to reduce spilling along the way. When leaving the site, the vehicles must be clean and no earth and sand shall be taken out of the site. The pavement shall be sprayed with water to reduce raising dust.</p> <p>④ The temporary stockpiling point shall be in low-lying place as far as possible</p> <p>⑤ The mud, sand and stone shall not be stockpiled too high, which can reduce the dusting under wind action</p> <p>⑥ It is required to send the dredging sand and earth</p>	EMP Chapter 7	Contractor	ESE, IEMC	The ESE conducts on-site supervision; Regulations are complied with; the environmental monitoring proposal has been prepared.	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>stockpiled temporarily to other sites for filling to reduce the stockpiling time.</p> <p>⑦ The dredging project shall be selected in low-water season and autumn and winter are better; avoid the hot summer when the smell of bottom mud diffuses, which can reduce the influence of stink on the surrounding residents. Meanwhile, execute the construction in section. The bottom mud dredged shall be transported to the stacking yard on site and shall timely carry out the ecological recovery treatment is required. With the construction completion in each construction area and sludge hardening in the stacking yard and vegetation recovery, the stink will disappear gradually.</p>					
	Impacts of other construction activities on the atmospheric environment	<p>① The floor level on the construction site must be hardened; if conditions permit, concrete floor level shall be adopted;</p> <p>② In the process of excavation, drilling and removing, spray water to keep the work moist; the loose and dry surface earth on the construction site shall also be watered frequently to prevent and control dust; when backfilling earthwork, it is required to spray water appropriately when the surface earth is dry to prevent raising dust; it is prohibited to execute construction in windy weather and determine the construction place reasonably;</p> <p>③ Strengthen the management of stacking yard of backfilling earthwork. It is required to establish measures for earthwork surface compacting, regular water spraying and covering etc., the earth and waste building materials not needed shall be removed timely and shall not be stacked for a long time.</p> <p>④ During construction, it is required to take full-closed construction measures to prevent and control dust</p>	EMP Chapter 7	Contractor	ESE, IEMC	The ESE conducts on-site supervision; the Regulations are complied with; the environmental monitoring proposal has been prepared.	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>pollution. The earth transporting trucks and building material transportation vehicles shall be covered with manta, canopy or subject to other spilling measures as specified. The loading shall not be too full to ensure there is no spilling in the process of transportation; plan well the operation route and time of transportation vehicles to avoid the running of vehicles in prosperous areas, traffic concentrated areas and residential areas and other sensitive areas as far as possible; for the road section with high environmental requirements, it is required to select night transportation as the actual situation to reduce the influence of dust on environment. The earth spilling on the ground in the process of transportation shall be cleaned in time to reduce raising dust in the process of operation;</p> <p>⑤ The removing and road construction site shall be enclosed with color plate.</p>					
Ecological environment	Influence of river course rehabilitation on ecological landscape	<p>① After the main works completion of dike of each section, it is required to execute slope protection works and construction site vegetation recovery measures. Make full use of the available greening land within the management scope of dike and grow appropriate herbaceous plants according to water and soil conservation measures.</p> <p>② Temporary construction project area The temporary works mainly include temporary construction layout area and construction warehouse etc., in the process of construction, it is required to consider the drainage measures of such part and excavate drainage ditch. During construction, it is required to take temporary measures for protection. After construction is ended, the construction unit must remove all surface buildings and hardened floor for</p>	EMP Chapter 8	Contractor	ESE, IEMC	The ESE conducts on-site supervision; Regulations are complied with; the water and soil conservation report has been prepared	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>recovery, clear the wastes caused by removing, Remove from the construction remaining debris, which adverse to crop growth, clear and remove them in time, centralized stacking and do its protection work well. Loosen the surface earth and conduct supporting recovery to the filed irrigation and drainage ditches to improve the earth.</p> <p>③ Management measures</p> <p>During construction, for strengthen construction management and supervision, regulate construction behaviour to reduce vegetation loss caused by construction land occupation and construction activities as far as possible and reduce the destroying to habitat of wild animals.</p> <p>Regulate construction behaviour, execute construction reasonably and orderly, optimize construction organization, implement gradual propelling construction in the same direction for the same construction section. For the adjacent construction section, the construction peak hours shall be staggered to avoid large-scale group construction in the same area and reduce the disturbance of disordered construction on the terrestrial ecological environment.</p> <p>During construction, strengthen environmental protection publicity education and propaganda on wild animal protection knowledge to the construction personnel in forms of announcement, pamphlet, blackboard newspaper and meeting etc, to improve the environmental protection consciousness of everyone; construction personnel are prohibited to hunt wild animals such as frogs, snakes, beasts and birds and engage in other activities hindering environmental protection.</p>					

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
	Impacts of other construction activities on the ecological landscape	<p>① The flowers and trees in the middle of, and next to the road section shall be transplanted well and protected, it is not necessary to destroy them. It's better to transplant them and supplement to plant according to the design. It is required to pay attention to protect trees and grassy areas in adjacent zone in construction period.</p> <p>② Try best to build road within the range of red line in construction period and the mound and windrow shall not intrude into farmland nearby.</p> <p>③ In construction period, it is like "ruins" due to demolition, thus it is required to begin construction orderly so as to avoid messy landscape along the line for resistance landscape, the dam-board (wood, glass, iron sheet etc.) can also be set to reduce landscape pollution.</p> <p>④ It is required to reasonably adjust the work of excavation and filling and avoid excavating and filling earthwork during rainfall, so as to prevent water loss and soil erosion, water pollution and drainage pipe blocking.</p> <p>⑤ On the premise of meeting the requirement of project construction, it is required to try best to save occupied land and reasonably arrange the construction progress. After the project is finished, timely clear construction site, empty occupied land and recover the original road and greening.</p> <p>⑥ Reasonably arrange construction period, avoid construction in rainy season to furthest reduce water loss and soil erosion.</p> <p>⑦ Reasonably design borrow area and spoil ground and borrowing and spoiling earth in scenic zone is not permitted; enhance the training management of construction personnel and it is required not to enter the scenic zone to cut down trees and plunder animals.</p>	EMP Chapter 8	Contractor	ESE, IEMC	The ESE conducts on-site supervision; the regulations are complied with the water and soil conservation report has been prepared	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
Solid waste	River course rehabilitation projects	<p>① The earthwork happened in construction period includes river channel excavation and backfilling, etc. The bottom mud in river channel is mainly the alluvium brought about due to surrounding catchment and water loss and soil erosion. The heavy metal content of bottom mud is far lower than the standard by monitoring, and it will not cause adverse effect to the soil and groundwater. After the bottom mud is excavated and sent to spoil area with natural withering, the yard absolutely can be restored as the equal of cut and fill in the XETDZ2.</p> <p>② It is required to classify and centralized collect domestic garbage produced during construction, which is disposed by local sanitation department.</p> <p>③ After finishing the Project, it is required to demolish the temporary facility in construction area, clear construction waste and all sorts of sundries, clear and levelling surrounding domestic garbage, simple toilet and sewage sump, disinfect them by carbolic acid and quicklime, and make well recover construction site.</p> <p>④ Contractors shall appoint person to take charge of collection of processing waste, and the scrap iron, waste steel bar and waste wood, etc. shall be piled in appointed place; the waste materials shall be recycled and disposed centrally.</p> <p>⑤ It is required to employ closeness or cover measures for the transportation of domestic garbage and construction material to avoid sprinkling of garbage, sandstone and soil aggregate along the road or discard them in river channel.</p>	EMP Chapter 7	Contractor	ESE, IEMC	The ESE conducts on-site supervision; the regulations are complied with	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
	Impacts of solid waste	<p>① Orderly stockpiling as planned so as to avoid causing disorder land occupation, water loss and soil erosion.</p> <p>② The domestic garbage shall be collected to refuse transfer station by manual work, and then put into the refuse landfills in Xuancheng.</p> <p>③ Most of the wastes due to resettlement demolition such as doors and windows, masonry, wood, and steel bars may be recycled for reuse. The remaining debris will be addressed by the Development Zone and systematically treated and used for road construction.</p>	EMP Chapter 7	Contractor	ESE, IEMC	The ESE conducts on-site supervision; the regulations are complied with	Every day
Water and soil loss	Water and soil conservation in the region	<p>① Road and pipe network project: take well preventive and protective measures, reasonably adjust and use of the equal of cut and fill, optimize construction technology, try best to reduce waste slag, take well protective measures for temporary block, drainage, sand setting and cover, etc. in the process of road construction, pay attention to green vegetation, improve and recover ecological landscape; set corresponding flood control and drainage facility for pipeline and subsidiary project area, protect well the temporary stock dump and drainage of construction site in pipeline construction area, and consider recovering vegetation.</p> <p>② River channel rehabilitation: conduct disposal of excavation, and it is required to block first and spoil later. Consider to take the protective measures for the steep revetment and retaining wall of river channel and plant trees in both sides of river channel. Take the cofferdam blocking and protective measures during construction.</p> <p>③ It is required to carry out well strip topsoil for WTP, dewatering and sand setting in factory, cover earth and</p>	EMP Chapter 8	Contractor	ESE, IEMC	The ESE conducts on-site supervision; the regulations are complied with	Day-to-day

Activity	Potential influence problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
		<p>green in later phase, temporary mound blocking, dewatering and protective during construction.</p> <p>④ Spoil area: it is required to take measures for intercepting and drainage system, temporary mound blocking, and block waste slag first and then give up. Rehabilitate the land and recover vegetation according to land use planning in later phase.</p> <p>⑤ Take measures of temporary drainage and cover etc. in road construction area and construction site, clear and levelling the construction site, and recover farming or plant grass.</p> <p>⑥ High-pressure gallery environment rehabilitation. Rehabilitate the land, conduct drainage and then ecological environment greening, constituting the overall structure of “big ecology” across the whole region. It is organically combined with the ecological “point”, “line” and “aspect” in XETDZ to forming a complete green ecological system.</p>					

Table 5-3 Environmental impact and mitigation measures in operation period

Activity	Potential effects/problems	Mitigation measures	Reference to EMP and RAP	Implementation responsibility	Monitoring responsibility	Monitoring indicator	Monitoring frequency
Acoustic environment	Road noise effects	<p>① Install ventilated sound insulation windows for a row of buildings of Jinda resettlement community along the street (2021 noise monitoring);</p> <p>② It is required to leave 80 m distance from the red line of the main road for acoustic environment sensitive buildings like Maosheng Jingyuan</p> <p>③ It is required to impose restrictions on the functions of the area along the main road. Roadside buildings shall be planned and arranged rationally with optimized acoustic design. Install sound insulation windows for the houses along the road. In addition, it is suggested to try to arrange warehouses, plants and green lands etc. within 80 m from the road.</p>	EMP Chapter 6	XETDZ	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	When the Project is finished
	WWTP noise effects	<p>① When ordering high-noise equipments, it is required to provide a explicated requirement for the noise value. In addition, it is required strictly control the process of equipment installation to improve the installation accuracy.</p> <p>② Adopt sound insulation measures and vibration-reduced measures etc. In the operating room, it is required to set the doors and windows of sound insulation. For plant walls, it is required to adopt new materials of sound insulation and sound absorption. The post operators shall wear earplugs, earmuffs and other protective devices.</p> <p>③ Use and plan the land around the plant well, It is not suitable to construct dwelling buildings nearby</p>	EMP Chapter 6	Project owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly
	Noise effects of pumping station	Purchase low-noise equipments with sound insulation measures and vibration-reduced measures	EMP Chapter 6	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly

	Noise effects of urban gas supply station	<p>① Select low-noise equipments and for the vent nozzles the silencers are installed.</p> <p>② Set hedgerow for noise insulation; plant trees around the station yard for afforesting; Around the technical devices in plant area and at both sides of the road, the afforesting shall proceed too.</p> <p>③ The station yard shall be far from the residential area.</p> <p>④ The pigging work shall be arranged at daytime as far as possible to prevent disturbing the residents.</p>	EMP Chapter 6	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly
	Noise effects of garbage disposal	<p>① Select low-noise equipments</p> <p>② The garbage transportation time is avoided to be arranged in the rest time of people. In addition, it is required to control the speed. When passing the villages and residential areas, it is prohibited to whistle at night to prevent the noise disturbing the residents.</p>	EMP Chapter 6	Project Owner	Bureau of Environmental Protection XETDZ Branch	The regulations are followed with; a environmental monitoring proposal	Monthly
Surface water environment	WWTP effects on surface water body	<p>① WTP shall prepare the operation management regulations for wastewater treatment unit as well as post system, regulations concerning rewards and disciplinary sanctions etc., and maximally control the wastewater accidents due to operating faults.</p> <p>② Keep the optimum water temperature, dissolved oxygen state and pH value for biochemical pool.</p> <p>③ Control the quality of water intake and strictly control the first-type pollutant discharge sources such as Pb, Cd, As and Hg to ensure the normal operation of WTP</p> <p>④ WTP shall be provided with accident wastewater storage pool. In case of any accident, the wastewater shall be discharged into the pool temporarily.</p> <p>⑤ According to relevant regulations, in order to realize the effective monitoring on WTP, it is required to install the electromagnetic flowmeter and the online monitor for water inlet and outlet, as well as leave the monitoring position for sampling and shall be set up the logotype for environmental protection.</p>	EMP Chapter 6	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly

Underground water environment	WWTP effects on ground water	<p>① Do well on the antiseptic and seepage-proofing work as well as daily management for the wastewater treatment devices to prevent pipe fracture, wastewater station overflow and leaking or other accidents;</p> <p>② Improve follow-up management and carry out the tracking and monitoring on underground water.</p>	EMP Chapter 6	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly
	Effects of refuse transfer station on ground water	<p>① Don't set percolate treatment devices in all transfer stations. The garbage shall be packed in boxes and the percolate generated in compression process will be stored in the collection well temporarily. Every day, it is required to adopt fecal suction truck to carry them to landfills. The percolate entered the landfills will be treated by the treatment system and will discharged after reaching the standard.</p> <p>② Construct seepage-proofing facilities for percolate collection wells well</p>	EMP Chapter 6	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly
Atmospheric environment	Road effects on atmosphere	<p>① Improve the road management and pavement maintenance; keep the good operation state for the road; reduce the tail gas discharge of vehicle; improve the road operation management; inspect the vehicles on the road; it is prohibited the vehicles on the road with bad vehicle conditions, as well as overloading vehicles, vehicles with incompletely covered goods and easily spilling vehicles running.</p> <p>② It is required to strictly execute the motor vehicle exhaust emission standard established by the state, reinforce the degree of law's execution of department of motor vehicles. It is prohibited to passing the motor vehicles whose pollutant emission exceeds the standard, so as to reduce the tail gas pollutant emission</p> <p>③ Improve afforestation, and make use of plants for absorbing pollutants to reduce the pollution.</p>	EMP Chapter 6	XETDZ	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly

	<p>WWTP effects on atmosphere</p>	<p>① Set up the isolation strip with strong anti-pollution capacity and the strong capacity to absorb harmful gas which is made of lofty trees around the factory area so as to realize the screen and absorption functions. ② Overridable stink pollutant sources shall be covered and sealed up to reduce the emission of bad smell ③ Improve the sludge management to be convenient for immediate transportation and treatment. When transporting, it is required to prevent discarding or throwing on the way. The treatment method will be appropriate to prevent secondary pollution. ④ Set up the width of sanitary protection zone. Within 100 m area around the plant area (especially downwind), do not develop the residences, schools and other crowd projects. ⑤ Improve the maintenance and repair for biological deodorising system to ensure to maximally collect and effectively deal with the stink.</p>	<p>EMP Chapter 6</p>	<p>Project Owner</p>	<p>XETDZ Environmental Protection Branch office</p>	<p>The regulations are complied with; the environmental monitoring proposal</p>	<p>Monthly</p>
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	Effects of garbage disposal on atmosphere	<p>① Set up the natural-plant pharmaceutical spraying system on the upper part of receiver bin of the refuse transfer station, after receive garbage collection car into the unloading truck signal, automatically start the corresponding stall spraying system; use the natural-plant pharmaceutical spray to remove the dust and deodorize.</p> <p>② The operations of processing garbage (discharging platform, material pit and pushing and pressing technology) of the whole refuse transfer station will be concentrated in the main power room in the project design of the refuse transfer station. In addition, the draught fan will be equipped on upper part of the main power room to keep certain negative pressure in the workshops. After the bad smell is subject to the deodorization treatment in deodorization tower for discharge, the bad smell will be discharged to minimize the effect of bad smell from the refuse transfer station.</p> <p>③ The temporary storage time will be shortened for the garbage in each refuse transfer station. It will be removed at least two times everyday to reduce the output of the bad smell.</p> <p>④ Stink of public toilet. Timly flush the toilets in operation, spray disinfectants, place deodorants to minimize the generation of the stink pollutant.</p>	EMP Chapter 6	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; the environmental monitoring proposal	Monthly
Solid waste	WWTP solid waste effects	<p>① The sludge will be transported to Xuancheng Sanitary Landfills for Sanitary landfill disposal after being mechanically pressed and filtered .</p> <p>② It is recommended to set up the special monitoring departments or full-time (part-time) personnel. The all process of sludge production, transportation, storage, treatment and disposal will be controlled and managed. The personnel and the units without relevant operation qualifications are prohibited to engage in the sludge transportation. The sludge transportation vehicles will be taken such measures as seal-up, water proof, seepage prevention and anti-spilling.</p> <p>③ After the WWTP is under normal operation and the technical means are available, carry out laboratory tests on the WWTP sludge.</p>	EMP Chapter 7	Project Owner	XETDZ Environmental Protection Branch office	Visual check; refuse disposal record; the regulations are complied with	Monthly

	Domestic refuse	Garbage should be collected manually at regular intervals and finally dumped into the garbage landfills through refuse transfer station	EMP Chapter 7	Owner	XETDZ Environmental Protection Branch office	Visual check; refuse disposal record; the regulations are complied with	Monthly
Risk	WWTP operational risk	<p>① The maintenance and management of pipe network and pumping station should be implemented to prevent silt clogging due to sedimentation, which has influences on the discharge capacity of the pipes.</p> <p>② The pumping station and WPT are applied in the double circuit power supply and a spare pump should be considered in design.</p> <p>③ Strictly control the technical parameters of the treatment units such as water quantity, water quality, retention time and loading intensity etc. to ensure the stability of the treatment effect</p> <p>④ The maintenance and management of malodorous gas biological deodorization devices should be strengthened; moreover, to prevent the accident of biological deodorization devices, a set of emergency biological deodorization device should be established for standby.</p> <p>⑤ The safety responsibility system and a set of complete work management system should be established to ensure that the tasks shall allocated to the individual, responsibilities are clear and regular inspectio. Emergency response measures for risk accidents should be formulated and with explicit emergency and rescue operating system should be clarified in case of any accident.</p> <p>⑥ The operation management and monitoring work on intake and outtake water should be strengthened, and the wastewater untreated and beyond limits should never be received and discharged.</p>	EMP Chapter 9	Owner	XETDZ Environmental Protection Branch office	Accident record	Annually

	Fire and explosion risk of urban gas supply	<p>① When selecting the route for this Protect, it is required to consider planning, environmental protection and safety. For the pipeline, it is required to strictly execute the provisions for various safety distances in the regulations. There should be a certain protection distance between the environmental sensitive points along the road and the pipelines t-There should not be large scale enterprises which produce or store toxic chemicals along the road. To prevent natural gas leaking alone the pipeline once, which will lead to the secondary pollution from fire explosion, or toxic gas emission, toxic liquid release. It is suggested that the safety distance between the pipe arrangement of this project and surrounding environmental sensitive points should be more than 20 m</p> <p>② Adopt advanced technologies and equipments like pigging under constant gas supply and automatic closing block valve etc.</p> <p>③ When choosing laying-out for pipelines, try to keep away from landslide, soft earth, mud-rock flow or other unfavorable construction section. When coming across roads, rails and rivers, it is required to take corresponding protective measures, so as to minimize the accidents risk like the line fracture.</p> <p>④ The accident prevention will start with management and operation for the Project. A set perfect systems such as take various measures, set up alarm system and prohibit accidents risk should be established..</p>	EMP Chapter 9	Project Owner	XETDZ Environmental Protection Branch office	The regulations are complied with; accident record	Annually
Social environment	Effectiveness of complaint appeal system	A set complaint systems should be established and provide hotline phone number for appeal which will be shown at the main accesses of the project area. Each case will be recorded and solutions should be given in written form within 7 days.	EMP Chapter 11	XETDZ	XETDZ Environmental Protection Branch office		
	Whether the public participate in the environmental monitoring	The community environmental monitoring team with 3 persons should be set up to monitor the environmental condition of the Project in operation period.	EMP Chapter 11	XETDZ	XETDZ Environmental Protection Branch office		

<p>Accumulative environmental effects</p>	<p>Effects of XETDZ2 development on surface water environment, underground water environment, air environment, acoustic environment and ecological environment</p>	<p>The accumulative solutions for effect have been listed in the XETDZ2 planning environmental report. The XETDZ adopts the best management practice (BMP); establish the dialogue mechanism with the stakeholders to monitor XETDZ2 development and ecological situation.</p>	<p>EMP Chapter 10</p>	<p>XETDZ</p>	<p>APED, XETDZ EPB</p>	<p>Planning environmental evaluation report of XETDZ2 is approved; organize various meetings</p>	<p>Annually</p>
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8 Supervision and Monitoring Plan

6.1. Supervision for Environmental Management

The Supervision Engineer Company is responsible for inspecting, supervising and auditing all construction activities to ensure that mitigation measures adopted in the EMP are properly implemented, and that the negative environmental impacts caused by the Project be to be minimized. The Supervision Engineer Company is required to designate Environment Supervision Engineer (ESE) who will be responsible for conducting daily on-site supervision on environmental mitigation measures executed by contractors.

The key supervision contents of ESE include:

Phase I: Preparation

The job purpose of Phase I is to lay the groundwork for the successful execution of the Project. In this phase, the ESE will:

- Review the EIA, EMP, Project's design proposal and technical specifications and confirm that there have been no major omissions in mitigation measures;
- Prepare the relative guidelines for contractors to implement the EMP;
- Develop and execute a training program for all parties involved in construction activities.

The main tasks in the phase I is as follows:

- **Review of Project Documents:** The ESE will review the EIA, EMP, Project's design proposal and technical specifications and confirm in writing that there have been no major omissions in mitigation measures. If any issues are identified, the ESE shall propose to the Project Management Office (PMO) updates for the EMP and the design proposal and technical specifications to solve these issues. Once approved by PMO, the ESE will update the EMP.
- The ESE will review and approve the EMP Implementation Plan submitted by the contractors.
- **Environmental Supervision Checklist:** The ESE will establish a comprehensive checklist to use for monitor the contractor's performance during the Project construction. The checklist will cover major aspects of the Project, the mitigation/control measures required and their implementation schedule.
- **Log-Book:** The ESE will prepare a log-book to record each and every circumstance or change of circumstances which may affect the EIA or which may result in the recommendations made by the ESE to correct the non-compliance.
- **Environmental Training:** The ESE shall design and execute a comprehensive training program for all involved parties including Supervision Engineers, PMO staff, contractor's Safety and Environment Officer, contractor's workers, etc.. The training content including environmental requirements of the Project, and how they will be supervised and audited, especially in the following aspects:
- **EMP:** The requirements of the EMP, the agreed environmental monitoring checklists, the environmental monitoring forms, how non-compliance with the EMP will be handled, and all other key issues shall be covered. Particular attention will be paid to the specific conditions in each contract's technical specifications indicating how the EMP is to be complied with.
- **Health and Safety:** The health and safety requirements of the Project shall be clearly identified and communicated with the contractors and the PMO.

- At the training is ended, the contractors will also sign a statement to confirm they understanding of the relevant environmental regulations, the EMP, the compliance framework, and health and safety obligations. The ESE shall sign a similar statement to confirm they understanding of the supervision responsibilities. These statements shall be submitted to the PMO and the World Bank.

Phase II: Supervision of Construction Activities

- Review and inspect all aspects of the implementation of the EMP by an independent, objective and professional manner;
- Carry out random monitoring checks and review for records prepared by the contractor;
- Conduct regular site inspections; Review the implementation of environmental protection measures according to the EMP and contract documents. The major non-compliance by the contractor will be cause for suspension of works and other penalties until the non-compliance has been resolved to the satisfaction of the ESE.
- Inspect the contractor whether meet such regulations as the environment, public health and safety.
- Review the effectiveness of environmental mitigation measures and project environmental performance;
- Review the environmental acceptability of the construction method (both temporary and permanent works), relevant design plans and documents for application. Where necessary, the ESE shall seek and recommend the alternatives of least environmental impact in consultation with the designer, the contractor(s), and the PMO;
- Verify the investigation results of any non-compliance of the environmental quality and the effectiveness of corrective measures;
- Provide regular the audit results back to the PMO and CST according to the procedures for non-compliance in the EMP;
- Provide a training every six months at least and every time there are new workers or new contractors coming into the site. The training content shall include EMP requirements, prohibited item, abide by the rules and regulations and environmental awareness.
- Regularly monitor the performance of the ET, verify monitoring method and results. In case where the ESE considers that the SEO or any member of his team fails to perform duties or fails to comply with the contractual requirements, the ESE shall require the contractor(s) to replace the SEO or the member of the team;
- Requires the contractor(s) to take corrective actions within a specified timeframe, according to the contractual requirements and relative procedures in the case of non-compliances or complaints, and can carry out additional monitoring if required;
- Requires the contractor(s) to take the actions to reduce the impacts and follow the EMP procedures specified in case of non-compliance/discrepancies;
- Requires the contractor(s) to stop activities which generate adverse impacts and/or when the contractor(s) fails to implement the EMP requirements/remedial measures;
- The ESE shall ensure compliance with the requirements of the health and safety clauses in the contract documents.
- The ESE shall identify the area with potential environmental issues through daily site visits, walks and visual inspections so as to implement regular on-site inspection and strictly supervise construction activities. The area of inspection shall cover both the

construction areas and the surrounding environment of area affected by the contractor's activities directly or indirectly.

- The ESE shall have their own hand-held and portable monitoring equipment such as cameras, transport and other resources. Where additional monitoring is necessary to resolve the contentious issues or to impose penalties, the ESE can sign a contract with the third party to carry out specific monitoring work at the locations under review.
- Where there is infringement of technical specifications, or contractual conditions, or non compliance with the EMP, the ESE shall be immediately inform the contractor's Safety and Environment Officer (SEO). The ESE shall be also submitted all infringements to the PMO so as a part of the monthly reporting responsibilities.
- The ESE shall be regularly with the contractor's (SEO) to jointly organize a environmental site inspection (e.g. weekly). The ESE shall take advantage of this opportunity to further training the contractors' staff.
- The ESE must take care of the field's log-book for inspection by all persons participating in project management at any time.
- The ESE shall also regularly review the records of the contractors to ensure that these data are up to date, factual and meet the EMP reporting requirements (e.g. environmental complaint register).
- Complaints will be received by the contractor's site office. The ESE shall be provided a copy of these complaints and ESE shall confirm that they has been properly solved by the contractor in the same manner according to issues identified during site inspections.
- The ESE shall work closely with the contractors and the PMO in the event that an incident arises which was not foreseen in the EMP or EIA and confirm the satisfactory resolution to the incident. The ESE shall then update the EMP and the implementation guidelines, and training the contractors' staff accordingly.
- The ESE shall confirm the monthly payments for relative environmental protection activities as recommended by the ESE to the client.

The ESE shall prepare the following written reports at least:

- Weekly report on non-compliance issues;
- Summary monthly report on covering key issues found from reviewing and supervision activities; and
- Consolidated summary report from contractor's monthly report

The ESE shall also collect and report on data as requested by the PMO.

- At the Project is end, the ESE shall prepare a final report summarizing the all findings from their work, the number of infringements, resolutions, etc. as well as advice and guidance for how such assignments should be provided in the future.
- During the Project implementation, the ESE shall provide briefings on the Project progress, incidents, and other brief report associated with environmental management and supervision requested according to the PMO, environmental agencies and World Bank. These briefings should be submitted 1 time every six months at least.

6.2. Environmental Management Monitoring

The Independent Environmental Management Consultant (IEMC) will inspect, review, verify the overall environmental performance of the Project through regular inspections and review. This review will provide confirmation that the results reported are valid or not and that the relevant mitigation measures and monitoring program provided in the EMP are fully complied with or not. IEMC will review and audit the content of all aspects in the EMP in an independent, objective and professional manner through regular and random check the

following items:

- Review the implementation of environmental protection measures according to the EMP;
- Review the effectiveness of environmental mitigation measures and the Project's environmental performance;
- On a need basis, test and verify the environmental acceptability of the construction method (both temporary and permanent works), relevant design plans and documents for application.
- Inspect the investigation results of any non-compliance of the environmental.
- Feedback audit results to XEDTZ and ESE team according to procedures of non-compliance in the EMP, and provide Supervision Engineer (ESE) suggests on actions of penalty, suspension of works or other punishment;
- Prepare the semi-annual report submitted to the XEDTZ, APTD and the World Bank.

6.3.Environmental Monitoring Plan

The environmental monitoring during project implementation stage shall be carried out by Environmental Quality Monitoring Consultant (EQMC) appointed by the Project owner. The EQMC will collect periodically environmental samplings (including water, air, noise, etc.) at selected locations. Such monitoring results, audits and sampling results shall be submitted to the Proponent so as to judge all kinds of index of the Project is in compliance with environmental regulations or not.

Monitoring plans in this EMP context shall focus on the following key aspects:

- The project owner commits to undertaking all kinds of monitoring programs related to the Project;
- Monitoring will be probably implemented for aspects of the Project which have been predicted to have an effect on the environmental and social resources in the Project area, check item including air quality, noise, water quality, soil quality and socio-economic resources;
- The project owner shall regularly carry out a trend analysis on monitoring data of various monitoring program so as to evaluate the success of the various monitoring programs is successful or not. This analysis will be used to determine if any changes or adjustments to the monitoring programs are required; and
- Work with Environment authorities to design newest monitoring programs as necessary.

Based on the EIA results, it is concluded that during the Project implementation has particular effects on the surrounding environment under normal circumstances,. In general, these effects can be decreased by environmental protection measures. Planning and implementation of XEDTZ2 development process will produce significant positive impact. The comprehensive monitoring program and evaluation plan has been listed in the EMP.

In order to examine the effectiveness of the mitigation measures, shall carry out monitoring work to confirm the mitigation measures effectiveness over a reasonable timeframe. Monitoring must compare environmental parameters to the base line data and prescribed decision criteria objectives in the EIA Chapter Section 1.4 Laws regulations or standards.

6.2.1 Introduction to Monitoring Procedures

The monitoring program and monitoring frequency shall be designed to quantify the overall environmental performance of the Project works as well as any short-term impact due to intense construction activities. More specifically, as a key component part of the EMP, the environmental monitoring plan shall include the following objectives:

- Confirm the impacts forecasted by environmental impact assessment processes, EMP development and monitoring processed;
- Determine the actual extent and magnitude of the impacts;
- Evaluate the effectiveness of the mitigation measures;
- Identify and adjust any additional mitigation measures aim at the unexpected impact during project implementation; and
- Keep tracking and update the monitoring methods and objectives of the environmental quality related to the Project according to newest regulatory criteria.

During the peak construction period or at the request of the client, the EMS will also carry out additional measurements to monitor short-term impact. If non-compliance with environmental quality performance criteria is identified, additional monitoring shall be carried out.

6.2.2 Monitoring Parameters

Table 6-1 Environmental Monitoring Program during Construction

Monitoring Factors	Monitoring Place (Stretches)	Indicator	Monitoring Frequency	Who to implement
Water Quality	Construction camps, construction sites, sediment yard.	SS and Oil	Once quarterly	EQMC
Air quality	Work locations with large operating equipment., unpaved roads or space near sensitive area or sensitive environments. Incl. Fangbianwang Village, Changqiao Primary School and Jinda Residential Area	Total Suspended Particulates (TSP), PM10	Random sampling during peak construction period	IEMC
Noise	Work locations with large operating equipment., unpaved roads or space near sensitive area or sensitive environments, Incl. Fangbianwang Village, Changqiao Primary School and Jinda Residential Area.	Equivalent continuous sound level (L_{Aeq})	Random sampling during peak construction period	IEMC

Table 6-2 Soil and water conservation monitoring proposal in project construction period

	Monitoring area	Monitoring method	Monitoring content	Monitoring time interval and frequency	Monitoring organization	Execution standards and regulations
Construction period	Project area of urban roads and pipelines	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain	Unit with the qualification certificate for water and soil	Technical Specifications for Water and Soil Conservation

		quantity		conservation monitoring	Monitoring (SL277-2002)
	Survey monitoring method (Full range)	Scope of prevention responsibility, effect of prevention measures, Plant survival rate under measures	One monitoring prior to construction is started; one monitoring for each year in construction period; one monitoring after construction is ended		
Project area of river regulation	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion volume	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain		
	Survey monitoring method (Full range)	Scope of prevention responsibility, effect of prevention measures, Vegetation survival rate under measures	One monitoring before construction; in construction period, one monitoring for each year; one monitoring after construction		
Project area of environmental remediation under high-pressure gallery	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion volume	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain		
	Survey monitoring method (Full range)	Scope of prevention responsibility, effect of prevention measures, Vegetation survival rate under measures	One monitoring before construction; in construction period, one monitoring for each year; one monitoring after construction		
Sub-project area of waste water treatment	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion volume	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain		
	Survey monitoring method (Full range)	Scope of prevention responsibility effect of prevention measures, Vegetation survival rate under measures	One monitoring before construction; in construction period, one monitoring for each year; one monitoring after construction		
Spoil area	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion volume	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain		
	Survey monitoring method (Full range)	Scope of prevention responsibility, effect of prevention measures, vegetation survival rate under measures	One monitoring before construction; in construction period, one monitoring for each year; one monitoring after construction		

Construction area	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion volume	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain
	Survey monitoring method (Full range)	Scope of prevention responsibility, effect of prevention measures	One monitoring before construction; in construction period, one monitoring for each year; one monitoring after construction
Construction temporary road area	Ground observation method (1 place)	Current landform, terrain, vegetation condition, rainfall condition, water loss and soil erosion area, water loss and soil erosion volume	8~12 times per year; in flood season, one monitoring for each month; one monitoring respectively prior to, during and after rain
	Survey monitoring method (Full range)	Scope of prevention responsibility, effect of prevention measures	One monitoring before construction; in construction period, one monitoring for each year; one monitoring after construction

Table 6-3 Environmental Monitoring Proposal in Project Operation Period

Sources to be Monitored	Monitoring Location (Section)	Indicator	Monitoring frequency	Monitored by
WWTP effluent	Downstream of WWTP effluent outfall	pH, COD _{Cr} , BOD ₅ , NH ₃ -N	One day per month	Routine monitoring of the EPB
	WWTP outfall	pH, COD _{Cr} , BOD ₅ , NH ₃ -N	Once per day	WWTP laboratory
	WWTP outfall	pH, COD _{Cr} , NH ₃ -N	Online monitoring	Online instruments
WWTP odor	3 monitoring points at Fangbianwang, boundary of wastewater pumping station, leeward of the WWTP boundary	Stink, H ₂ S	One day per quarter	Routine monitoring of the EPB
Refuse transfer station, odor	4 monitoring points at such four refuse transfer stations at the North Road Third, at the Jinglin Road, at the Tieshan Road and at the Baosha Road	Stink, H ₂ S	One day per quarter	Routine monitoring of the EPB
Road noise	One at each of the Jinda resettlement community and Maosheng Jingyuan resettlement community	Equivalent continuous sound level (L _{Aeq})	Once per quarter	Routine monitoring of the EPB

9 Contractor Environmental Specifications

Contractor Environmental Specifications provide a series of guidelines, processes and procedures to ensure that the ecosystem environment is not detrimentally affected by the contractor's activities during the Project implementation. The Contractor is required to adhere to the guidelines established in this document. The general environmental issues associated with the contractor activities include the following:

- Site management
- Fuel and material storage and handling
- Dust and noise nuisance control
- Sewage management
- Waste management

The environmental issues related to specific project activities such as soil and water conservation plan, emergency response plan can see the following chapters and sections.

7.1. Contractor's Environmental Protection Plan

The Contractor must be provided with a copy of the EMP and the EMP should be included in the bid documents. Prior to the construction is started, the contractors are required to submit a site-specific Environmental Protection Plan (EPP) for their work so as to the ESE and XEDTZ for review. The EPP shall cover the generic environmental impact mitigation measures (as well as specific mitigation measures such as emergency response), main including, but not be limited to, the following items:

- Overall construction site plan, showing work areas, fuel storage areas and fuel supply areas, parking lots, equipment maintenance areas, material storage areas and camp areas.
- Waste management plan;
- Dust control plan;
- Noise control plan, and
- Solid waste management

7.2. Site Facilities

Contractor shall ensure that the construction camp a certain distance away from the surrounding industry. A layout plan for construction activities needs to be developed and approved by the ESE.

7.2.1 Labour employment

- If appropriate, the employment of labors should give priority to local labors.
- The contractors should publicize appropriate work positions to the villages and towns in XEDTZ2.
- The construction and the staff members should have legal contracts for employment
- The contractors should provide the construction workers with the educational training of environmental protection and occupational health and safety.

7.2.2 Requirements for Camping Site

- The contractors should provide appropriate and safe quarters for the construction workers.
- Independent and perfect bath facilities (toilet and shower) should be provided on the camping site for male and female workers respectively. Sufficient water supply, soap and toilet paper, etc. should be provided in the toilet. All these facilities are required to clean and sanitation, available for use. Toilet should be indicated with "Male" or "Female" obviously
- The kitchen at the camping site should have clean water and should be in hygienic condition.
- The domestic sewage of the camping site should be treated in the septic tank at least and should not be directly discharged into any waters.
- The camping site should provide medical and emergency facilities. First-aid kit should be provided at any camping site and managed by specially assigned persons who should receive full first aid training and obtain a corresponding qualification and could send the injured or the diseased to local hospital in time. The above medical and health supplies should be replenished in time once used.

7.3. Code of Conduct

The “Code of Conduct” shall be established for the construction workers with emphasis on appropriate behavior, the drug abuse and alcohol is strictly prohibited and abide by the relevant laws and regulations so as to reduce the influence on the society. Each worker should be informed of the “Code of Conduct”. The “Code of Conduct” for construction workers should be also known to the local community. As for failing to obey the “Code of Conduct”, disciplinary action should be accepted. The "Code of Conduct" includes but not limits to the following measures:

- All the staff members should obey the national laws and regulations;
- Hazard materials and dangerous weapons are prohibited in the construction site;
- Pornographic materials and gambling activities are prohibited in the construction site;
- No fighting is allowed;
- No interference to the production and life of the neighborhood as well as the local people;
- No disrespect to local traditional culture, custom and traditional activities;
- Smoking is only allowed in appointed area;
- Appropriate clothes and personal hygiene standard;
- Appropriate sanitary condition for the dormitory;
- The workers should obey the relevant “Code of Conduct” when visiting the neighborhood as well as the local people.

Prohibition

The following activities are prohibited on the construction site or nearby:

- Injury to the wild animals and the villagers livestock in the adjacent areas;
- Capture of protection animals or collection of protection plants;
- Purchasing protection animals as food;
- Interference and destruction of objects with architecture or history values;
- Bonfire;
- Drinking in working hours;
- Mechanical maintenance (replacement of engine oil and lubricant) outside the specified area;
- Dumping of refuse outside the specified area;
- Driving in danger on local road;
- Not safety dressing (e.g. safety boots and crash helmet) during the construction;
- Causing interference to the people nearby;
- Leakage of pollutants, e.g. oils;
- Burning refuse.

Any constructor(s), office worker or other staff member, if found breaking above-mentioned regulations, should be punished by the discipline such as by means from oral criticism to dissolution of labor contract according to the severity.

7.4. Health and Safety

- The contractors should ensure the projects conforming to all the national and local safety regulations as well as the other measures about damage avoidance.
- Prior to the construction, the contractors should provide safety training for the workers.
- Sufficient daylight and night illumination should be provided;
- The fence needs to be provided around the site to prevent interference. This needs to be checked and maintained during the construction;
- No irrelevant personnel is allowed to enter camp site without approval by management staff of the contractor(s);
- The camping site should be provided and equipped with fire-protection equipment such as fire extinguisher;
- The contractors should provide the workers with enough personal safety protecting devices, (e.g. protective glasses, protective gloves, protective mask, dust cover, safety helmet, ear protectors, steel helmet and so on), and ensure them to be used on the construction site.
- The safety rules, the emergency pre-plan and the emergency contact information should be indicated on the bulletin board at the construction site.
- All the places with potential damage should be marked for warn.
- Safety protection distance should be determined according to the relevant regulations.
- The contractors should take all reasonable measures to prevent the risk rising and ensure the construction site and all the camping sites provided with fire-protection equipments.
- Any engineering for requiring open flame could only be performed at the places approved by and in supervision of the ESE. And meanwhile, the corresponding fire-protection equipments should also be in place.
- The contractors should provide all the workers with annual physical examination.
- The contractors should also provide the training of personal basic hygiene and epidemic prevention, including respiratory disease and infectious disease.

- The contractors should carry out the educational activities about disease prevention and cure (esp. the protection against AIDS and venereal disease), including the propaganda on the construction site and neighborhood in the form of notification and training class for propaganda.
- The contractor(s) should provide the workers with basic first-aid service and emergency measures.
- The contractor(s) should establish necessary warn and speed bump etc. in the construction road (if any) near local communities to ensure the traffic safety of residents nearby.

7.5. Storage of Fuel, Oils, Dangerous and Toxic Materials

- All fuels for construction site should be stored in the fence, Storage area shall be 110% of the capacity of the fuel storage container. The fuel storage area must not be located near (i.e. distance water within 100 m) any water resource.
- The hazardous materials should also be stored in specifically designed storage facilities. Temporary storage provision needs to be made for the hazardous materials such as fuels, oils and paints.
- Access to this storage area should be only limited to relevant personnel.
- The store site must be protected from vehicle damage and must be regularly inspected for leaks, damage or pollution. shall also be
- Machine and equipment repairs must only take place within the confines of the contractor's camp. An operating surface (i.e. concrete floor in fende area) must be designed properly to insure that the oils, fuels, etc. collected into an appropriate containers. Where there have been oils/fuels leakages, the contaminated soil must be removed and disposed of at an appropriately permitted site.
- The precautionary measures must be always taken to prevent the pollution or erosion of the soil and water by grease, oils, fuels, solvents, chemicals, etc..

7.6. Waste Management

- During the construction, the Contractor(s) must make provision for the appropriate removal of waste from the site to a permitted waste disposal facility in a proper manner at any time. The accumulation of construction waste materials shall be reduced as far as possible.
- All domestic waste generated by the activities at the contractor's camp must be stored in either refuse can (i.e. 210 l steel or plastic drums) or in a waste skip car. The Contractor(s) must ensure that these refuse receptacle are emptied on a weekly basis, or as and when required.
- All refuse shall be immediately deposited into refuse can or the waste skip car. No litter must be left in the work areas or contractor's camp.
- Construction waste must be stockpiled in the contractor's camp and the Contractor(s) and the contractor shall be responsible for handling. The construction waste contaminated must be dealt with separately.
- The burning of waste at construction site shall be prohibited.

7.7. Wastewater and Storm Water Management

- Wastewater from construction site and camp are not allowed to be directly discharged into surface water body;
- Domestic sewage must be properly treated through (e.g. septic tank), prior to discharge.
- Stormwater must be implemented of measures to dissipate its energy so as to drainage into the river;
- The stormwater runoff exhaust from the construction site (the temporary drainage facilities) shall be evenly distributed as possible; and use of gabions, ripple beds and swales to reduce the velocity of water runoff.

7.8. Control of Noise

- Limit construction times to the day times;
- No noisy activities during construction near local communities at weekend shall be insured;
- Staff at site, visitors and construction workers on the site must be equipped with appropriate hearing protection measures to ensure noise impacts do not damage the persons hearing.
- The ESE must regularly inspect the construction site to ensure compliance with the “Occupation Health and Safety”.

7.9. Construction Stage Public Information Communication

Community (Public) Participation and Complaints Register (CR)

- During the construction, the contractor(s) should remain open communication with the local governments and the people of the relevant community.
- Prior to the construction, the Contractor(s) should publicize the Project information to the influenced parties (e.g. local government, enterprises and residents) in the form of community meeting.
- All the construction sites should be clearly marked about the project information, including but not limited to:
 - a) Project overview;
 - b) Construction plan;
 - c) Major construction activities;
 - d) Principal environmental problems and mitigation measures;
 - e) Names and telephones etc. of the Project manager, the supervision engineer and the environmental protection personnel.
- The contractor(s) and the ESE should regularly communicate with major sensitive receptors, so as to minimize the negative influence on these objects as far as possible .
- All the contractor(s) should provide the workers with the training about neighborhood relationship maintenance, communication, local custom and the “Code of Conduct”.
- Relevant complaints channel information must be disclosed at the entrance of the site;
- A complaints register must be kept on site in the main construction camp office. All complaints, issues and concerns shall be incorporated in feedback reports submitted to ESE and XEDTZ for check and approve;
- ed to the relevant parties to ensure that the complainant is satisfied.

7.10. Physical Cultural Resources

- Aim to provide training for the workers about historic relic education as well as historic relic discovery and protection procedures.
- If you have found the related resources

a) The contractor(s) shall stop the construction immediately and protect well the scene;

b) Report to the ESE and the owner as well as the local cultural resources authority; During the investigation made by the local authority, the contractor(s) should take appropriate measures to protect well the historic relic scene and implement weather precaution;

- c) Only after consent by related authorities, the contractor(s) can resume the construction.

10 Water and Soil Conservation Plan

In order to ensure the successful implementation of water and soil conservation measures and carry out the legal requirement that water and soil conservation facilities of constructing projects shall be designed, constructed and put into used concurrently with the main project, for water and soil conservation, it is necessary to take the measures as organizational management and technologies to ensure the project implementation through administrative and legal means.

The implementation of guarantee measures of this proposal include setting corresponding organizations, carrying out the management based on project legal person system, bid system and supervision system in project construction period as well as ensure capital resources and strengthening monitoring management.

After this water and soil conservation proposal is approved by the water administrative competent department, the content and investment of controlling measures established in this proposal will be included in the preliminary designing documents of the main project, separately forming in chapter. Any significant modification on the design will be reported to the original inspection authority for approval. The original approval water administrative competent department should participate in the inspection of the project preliminary design, so that the water and soil conservation measures can be carried out successfully according to the detailed design requirements.

8.1. Construction tender

For the implementation of the water and soil conservation works, it is required to execute the tender system. The construction unit, engaging in main works construction as well as water and soil conservation project, must have the technicians who are familiar with the water and soil conservation business and all technical requirements for water and soil conservation measures. In addition, strengthen the water and soil conservation training for construction team; strengthen the water and soil conservation awareness of the constructors; to improve the technical level and environmental awareness of the constructors; and give priority to the preventive work for water loss and soil erosion. In the project construction, the construction shall be carried out strictly following the approved water and soil conservation works proposal. It is required strictly execute *Technical Specifications for Water and Soil Conservation of Developing Project* as well as the technical standards and specifications related with the comprehensive treatment for water loss and soil erosion.

8.2. Water and Soil Conservation Works Supervision

Water and soil conservation supervision is an important measure to realize the water and soil conservation raised in this proposal. Water and soil conservation supervision will provide technical supports and guarantee for the construction units to effectively prevent water loss and soil erosion, so as to be ensured to reach the preventing and treating objectives raised in this water and soil conservation proposal and meet the special acceptance requirement for water and soil conservation. According to the special situation of this Project, water and soil conservation supervision will be included in the main project supervision for consideration, to strengthen the construction management. When accepting the water and soil conservation facilities, the main project supervision unit shall provide the supervision data related with water and soil conservation of this project, including videos and images, etc..

8.3. Water and Soil Conservation Monitoring

During the service period of this proposal, will strengthen the monitoring on water and soil conservation, monitor the dynamic change of water lose and soil erosion and the effect of water and soil conservation measures in project construction period, supervise and guide the implementation of water and soil conservation proposal and prepare corresponding supplemental treatment proposal for water and soil conservation measures to be supplemented. The construction unit will entrust the water and soil conservation monitoring unit with the corresponding qualification certificates to provide the report according to the monitoring content, method, time inveral and monitoring achievement as prescribed in the proposal regularly and the annual monitoring report shall be able to guide the construction of the next year. When designing the planning targeted year, the monitoring unit shall submit water and soil conservation monitoring report to present the implementation situation and effects of water and soil conservation measures and analyze the realization situation on the preventing and treating objectives for water loss and soil erosion. The monitoring report shall be able to meet the completion acceptance requirements for water and soil conservation.

8.4. Construction Management

Water resource authority supervises the implementation of water and soil conservation plan. During implementation, project owner shall cooperate with the water resource authority and accept the supervision. The project owner shall keep a record of the supervision and take corrective actions as required. During construction, quality check shall be conducted in a timely manner. Rectification action must be taken by the contractors until it is satisfactory to the quality standards. For greening measures, special attention shall be paid to cultivation and maintenance and ensure survival rate to maximize the benefits of greening measures to water and soil conservation.

8.5. Completion Inspection and Acceptance for Water and Soil Conservation

According to the requirements of “three-concurrent” system for water and soil conservation, when the completion acceptance is carried out for main works, the water and soil conservation facilities shall be accepted concurrently. After the water and soil conservation facilities passing acceptance and, the main works is available to put into operation. If the water and soil conservation facilities are unaccepted, the main works is not available to put into operation.

During the acceptance, it is required to submit the acceptance report and comprehensively assess the quantity and quality on implementation of water and soil conservation works so as to Summarize the successful experience and insufficient sections in implementation of water and soil conservation works. In case of any overdue section or defective works, it shall be ordered to be redesigned or be replenished to perfection till the water and soil conservation measure are able to reach the acceptance indexs according to the water and soil conservation level two preventing and controlling standards.

8.6. Capital Source and Usage Management

In accordance with the principle of “who develops who will project, who causes the water loss and soil erosion who will treat” and the provisions of Article 32 of *Law of The PRC on Water and Soil Conservation*, developing production construction project or engaging in other production construction activities causes the water loss and soil erosion,

which shall be treated. Special water loss and soil erosion prevention and treatment shall be implemented under the organization of the water administrative competent department. Management Methods for Collection and Usage of Water Loss and Soil Erosion Compensation will be prepared by the Ministry of Finance under the State Council, the department in charge of price under the State Council jointly with the water administrative competent department under the State Council, The water and soil conservation expenses incurred in the construction and production periods of production construction project shall be treated according to the unified national financial and accounting system.

11 Emergency Response Plan

9.1. Risk Response for Pipelines Accident

- (1) Human factors are often the main cause of accidents, and careful management and managing people's performance is an important part of accident prevention. Management of people will include to strengthen the awareness of the staff and operators to make them more responsible and proactive; to carry out on-the-job training to the operators in a systematic manner to make them familiar with the work programs, procedures and specifications, and to hold them accountable for their duties and obligations; to assign a safety patroler and carry out regular inspections and maintenance to address accident-prone parts in addition to regular checks by their operators in order to identify and address problems in a timely manner.
- (2) Careful reviews of the engineering designs are advisable. Design of the facilities involving safety, health and environmental aspects shall be carefully reviewed in accordance with relevant specifications and standards. Supervision and management shall be carried out carefully during the course of construction to ensure the quality of construction.
- (3) In the event of an accident, notice shall be given to concerned departments in a timely manner and effective measures be taken to minimize the impacts on the surrounding environment and damage to people's lives and properties.

9.2. Risk Response for Gas Station Accidents

- (1) Preventive Measures during the Preparation and Design Stage
 - Location of the alignments of the utilities shall avoid residential areas and those with complex geology, in order to reduce injury and property damage in the event of a natural gas leak and fire/explosion accident and the probability of hazards.
 - Wherever such buildings and areas with many people are unavoidable, higher safety factor shall be applied in the design to increase the thickness of the pipeline wall and provide for higher capacity against the external impact in an accident. According to the design code, the Engineering Design Code of Gas Utilities (GB 50251-94), areas where the gas pipeline passes through are to be categorized into three classes per the number of households and building density along the alignment, and the design of the utilities shall be carried out accordingly.
 - In case of an emergency, the natural gas will be vented by flaring as designed.
 - An emergency shutdown system is designed. Emergency shut-off valves are designed at the inlet and outlet of the gas supply station, which may be directly shut off in the event of some obvious faulty situations. The designed SCADA system will enable remote shutdown of the valves and complete shutdown of the entire system.
 - In order to prevent and reduce potential corrosion of the gas pipelines, epoxy powder coating will be applied at the external walls of the utilities, which will be added with electric current and cathodic protection as designed.
 - The facility is designed with a safety relief system, which may be operated automatically or manually to vent the system in the event of an overpressure.
 - The design teams are to strengthen their co-ordination to address the connections and interfaces so as to minimize mis-matched designs or other design problems for an integrated and quality design of the facility.

(2) Preventive Measures during Construction

- To strengthen supervision and construction management to ensure the coating quality of the utilities;
- To establish a QA/QC system for the construction period to improve the performance of the construction inspectors and strengthen the means of inspection.
- To develop and enact operation rules and management regulations, so that defects can be found and corrected in a timely manner, and the process be well recorded.
- To carry out hydrostatic test to eliminate defects existing in welds and materials as many as possible so as to enhance the pipeline safety.
- To select experienced contractors for the construction and an excellent third-party for careful oversight of the construction quality to reduce problems in construction.

(3) Prevention Measures during Operation

- To carefully control the quality the natural gas and regularly clean the utilities to eliminate stagnant water and dirt inside the pipe to reduce corrosion.
- To measure the pipe wall thickness every three years and carry out repair and replacement to the pipe segment with severely thinning wall in a timely manner to avoid pipes burst accidentl
- To check the pipeline safety protection system (such as a cut-off valve, safety valve, venting system, etc.) every six months, so that the pipeline could be handled safety in the event of an overpressure, and any harmful effects would be minimized.
- To provide signs where the utilities cross a railway, highway, or river, which are not only clear and explicit, but also visible from different directions and different angles.
- To carry out more frequent inspection of the utilities and to improve the effectiveness of the patrol, through daily checks of the utility zone on the land surface conditions and human being activities. Any human being behavior to the jeopardy of the pipeline safety shall be promptly stopped with appropriate corrective measures and a report to the superior.
- To carry out inspection on pipelines crossing rivers and other sensitive areas every three years.
- To take particular care of the river crossing segment of the pipeline during flood seasons.
- To pay attention to fire prevention during the course of venting in an accident at the sub-station of the transmission.

(4) Management Measures

- Operating manual and maintenance manual for normal, abnormal or emergency situations shall be prepared before the utilities are put into operation. People to carry out the operation and maintenance shall be trained and certified before they are assigned to a position. Any operator or service person shall be provided with a certificate for his/her intended position. Such provisions are intended to prevent an accident due to serious misoperation.
- To formulate emergency operation protocol, which shall specify the steps to be taken in the event of a pipeline accident, the required repair progress, and how to constrain the impact of the accident. Safety issues related to the pipeline operators should also be addressed.
- Safety education activities of the operators shall be carried out on weekly basis to improve their safety awareness and build up their capabilities to identify abnormal phenomenon before an accident and to take appropriate measures.
- To carry out awareness campaigns of safety facilities to the nearby communities, to inform on and implement the Regulations to Protect Oil and Natural Gas Utilities, so as

to avoid accidents due to damage by a third party.

- To provide inspection program and maintenance methods to important instruments and equipment. To carry out scheduled and periodic maintenance. To keep a specialized archive (including maintenance log file) with all the documentations.

(5) Emergency Plans

- The purpose to prepare an emergency plan against the risks and potential accidents is to be efficient and effective in the event of a risk-related accident, so that rescue can be carried out in an orderly manner, the situation can be well controlled, and injury and/or property loss due to the accident can be minimized.

9.3.WWTP Preventive Measures Against Accidents

(1) Pipe network maintenance measures

WWTP stable operation is closely related with the network maintenance. It is required to attach importance to pipe network, pumping station maintenance and management to prevent sediment depositing or clogging which may influence the pipe discharge capacity. The pipeline link shall prevent the leakage polluting underground water or hollowing out the foundation. The clogged shall be dredge in time to ensure the smoothness of the pipeline as well as maximally collect domestic wastewater and industrial sewage. In the design of main pipe and branch pipe, it is required to choose the appropriate fullness and minimum design flow speed to prevent sediment depositing.

The WWTP inflow pumping station shall be provided with special personnel to care. At ordinary times, the maintenance of mechanical equipments shall be strengthened. The maintenance shall be timely carried out to prevent resulting waste water flowing into the rivers nearby as soon as the accident occurs.

The strict maintenance system shall be formulated for the sewage pipe network.. The users shall strictly execute relevant national and local discharge standards. Especially, it is required to reinforce the management of the inflow water quality of accepted industrial wastewater, so as to ensure the WTP inflow water quality.

(2) Preventive measures of pollution accidents

The WWTP accidents originate from the equipment faults, overhauls or the deterioration of treatment effect due to the change on technical parameters. The preventive measures include:

1) WWTP adopts double-lines power supply. Prepare well the spare equipments like water pump or air blower for standby. The mechanical equipments shall use the high-quality products with reliable performance, imported products preferable.

2) In case of any WWTP shutdown accident, the big users of drainage units shall be regulated production to reduce the wastewater drainage and start accident emergency pool.

3) In order to rapidly response the WWTP accidents to recover to the normal operation, it is required to leave corresponding buffer capacity on the volume of main hydraulic structures with corresponding equipments (such as reflux pump, reflux pipeline, valve and meter etc.).

4) WWTP shall select to use the advanced equipment such as various mechanical equipments and meters which are the high-quality, low-accident rate, convenient for maintenance. The key equipments shall be required to provide two sets namely one for application and one for standby. The damageable parts shall be provided with standby parts,

so that the exchange is in time in case of any accident.

5) The technical parameters of the treatment unit such as water quantity, water quality, retention time, loading strength shall be strictly controlled to ensure the stabilization of the treatment effect. Shall provide with the automatic analyzing and monitoring instrument for flow and water quality to regularly take samples and monitor. The operating personnel shall be adjusted in time to make the equipment in best condition. In case of any abnormal circumstance, it is required to take preventive measures as soon as possible.

6) The safe operation specification shall be established. The daily work shall proceed strictly according to the regulations. The theoretical knowledge and operation skill for the WWTP personnel and carry out shall carry out regularly the training and inspection.

7) The operation management and the monitoring on intake and outtake water shall be strengthened. The unqualified water is prohibited to be discharged.

8) The wastewater pumping room shall be equipped with toxic gas monitoring instrument as well as necessary ventilating devices.

9) The safety responsibility system shall be established. Shall set up a set of complete system in aspect of daily work management to ensure that the work shall be carried out by each personnel with clear responsibilities and regular inspection.

10) The emergency measures of risk accidents shall be prepared and shall explicate the emergency and rescue operation system in case of accidents.

9.4. Countermeasures and Emergency Plan for Accidents

When collecting, transporting and treating WWTP wastewater, in case of any accident, it is necessary to carry out the emergency treatment according to the proposal prepared in advance. The content of emergency proposal as follows:

(1) General situation of risk source

Detailed risk source type, risk source size and location

(2) Emergency protection area

Including the water quality control area in Zhouhan River downstream.

(3) Emergency organization

The accident emergency organization shall be responsible for the comprehensive command on the accident field. The professional rescue team will be responsible for repairing or removing for the accident or fault.

(4) Emergency facilities, equipments and materials

Shall provide with the relevant spare equipments, tools and materials.

(5) Emergency communication, notification and transportation

Shall provide with the contact communications way under the emergency state to timely inform all relevant departments, must control well the accident field and determine the rescue team will arrive in time.

(6) Emergency protective measures

Control well the accident to prevent expansion or chain reaction; close relevant gates and start accident water pool to reduce the damage.

(7) Emergency condition termination and recover measures

Provide with emergency condition terminator, deal with the aftermath of accident field to rapidly recover WTP normal operation.

(8) Emergency environment monitoring and assessment after accident

Monitor the surrounding water environment of the significant accident field and assess on accident property, parameter and its aftermath, so as to provide decision reference for relevant departments.

(9) Personnel training and exercise

After the emergency plan is formulated, it is required to arrange relevant personnel to take part in training and exercise at ordinary times.

(10) Record and report

Shall set up the special record for accidents and it is required to establish the accident archive and report system and to arrange special full-time or part-time personnel in charge of management.

12 Cumulative Impacts Mitigation and Follow-up Assessment Plan

10.1. Cumulative Impacts Mitigation

Abatement of Air Pollution

- To layout admitted industries in a rational way in accordance with policies on the planned leading industries and the industrial land use plan;
- To strengthen the industrial exhausts and pollution control, covering following five aspects:
 - To promote clean production;
 - To optimize the energy utilization structure, taking advantage of adequate natural gas supply from the Gas Transmission Program to prioritize the use of natural gas;
 - To ensure effective treatment of the various categories of process exhausts of the industries;
 - To develop and consummate the environmental management and supervision;
 - To enact an effective and efficient accident and emergency emission mechanism; and
- To provide vegetated areas in a rational manner. As XETDZ2 is close to the Jingting Mountain Scenic Area on the east, an ecological shelterbelt consisting of tall trees, bushes and turf of a minimum width of 50 m shall be developed, forming distinct levels of green barriers along the eastern boundary of XETDZ2, to ensure that the development of XETDZ2 would not happen at a cost of the environmental features of the Scenic Area and would not affect the landscape consistency.

Abatement of Water Pollution

- Separate drainage systems shall be applied at the industrial land use and urban areas of XETDZ2;
- Clean production processes shall be promoted among the industries in the region;
- A wastewater discharge application and licensing system shall be fully implemented;
- To mandate compliant discharge that no industrial wastewater of any individual industry shall be discharged into the Changqiao WWTP for treatment until it is pretreated by the industry and meet the Level 3 discharge requirements, to ensure compliance discharge;
- To strengthen the conservation of the water environment in the region; and
- To carefully develop and follow the emergency programs of accident emissions.

Noise Control

- To control industrial noises by rational layout of the industries and compliant noise level at plant boundary.
- To control construction noises by reasonable scheduling of the construction activities.
- To control traffic noise by having no new residential buildings, schools and other noise-sensitive buildings within 50 meters from ROW of mobility arterials on both sides in the plan, and instead by providing green belts 20 to 50 meters wide, in order to take the advantage of the setback and the vegetation for abatement of the traffic noise.
- To control noise from social life.

Solid Waste Management and Disposal

- To strengthen the management of general industrial solid wastes by recycling the waste materials, diversify the utilization ways, and to strengthen the management of the transaction of industrial solid waste disposal by developing an information system tracking on the industrial solid waste generation, flow, storage, disposal, and transaction to encourage waste recycling and reuse among industries of the region.
- To enact a hazardous waste generation, reporting and registration system, and a facility operation license system on business to storage, collect, disposal and reuse of hazardous wastes, in order to

effect a whole process management covering the collection, transportation, storage, treatment/reuse, and disposal of the generated hazardous wastes.

To develop municipal solid waste collection system, storage systems, transfer and transport systems, and disposal systems to ensure non-hazardous disposal of the domestic wastes.

Recommended Priority Ranking of Industries for XETDZ2

Efforts shall be made to create incentives so that less polluting industries may settle down and develop in the zone, following the sectors of the leading industries the industrial development program of XETDZ2, the concept of recycling economy and the vision of an ecologically sustainable development zone. During the future development of the industrial areas, requirements of developing the leading industries and sectors should always be satisfied by following the development plan to upgrade traditional industries and cultivate high-tech industries. Any industry with low resource utilization efficiency and high emissions of pollutants shall be restricted. Any industry inconsistent with XETDZ2's industrial program shall be limited from access to the region, and any heavily polluting industry or having high water use shall be prohibited and not admitted. According to the industrial development orientation of XETDZ2, recommended control policies were given to a variety of industrial sectors, as shown in Table 10-1.

Table 10-1 Incoming industry control list of recommendations

Sector Code	Industrial Sector	Policy Recommendation
37	Transportation equipment manufacturing	Priority access
34	Metal manufacturing	Priority access
39	Electrical machinery and equipment manufacturing	Priority access
31	Agro- food and by-product processing	Limited access
27	Pharmaceutical manufacturing	Limited access
221	Pulp industry	To deny access.
19	Leather, fur tanning and processing	To deny access.
27	Chemical materials and chemical products manufacturing	To deny access.
08	Ferrous metal mining and selection	To deny access.
09	Non-ferrous mining and selection	To deny access.
32	Ferrous metal smelting and processing	To deny access.
33	Non-ferrous metal smelting and processing	To deny access.

Per table 10-1 Table , industries having preferential access to XETDZ2 are transportation equipment manufacturing, metal manufacturing, electrical machinery and equipment manufacturing, and communication equipment, while access will be controlled for agro-food and by-product processing, and pharmaceutical manufacturing, and will be denied for pulp and paper industry, leather, fur tanning processing, chemical raw materials and chemical products manufacturing, ferrous (non-ferrous) metal mining and selection, and ferrous (non-ferrous) metal smelting and processing.

10.2. 10.2 Follow-up Assessment Plan

Develop follow-up assessment is to analyze and evaluate the environmental impact caused due to plan implementation on the XETDZ2, so as to verify correctness of environmental impact assessment and judge the effectiveness of mitigation measures, and put forward the improvement measures. All environmental element evaluated in advance for the environmental impact shall be purposefully monitored, examined and counted so as to determine their actual variation which is compared with the predicted variation treated by environmental protection facilities in the environmental impact statement, meanwhile, compare the actual environmental impact caused by XETDZ2 planning implementation with predicted impact as a whole, and analyze and evaluate the results to further analyze its cause,

at last, further rectify, develop and perfect the planning scheme and all measures by evaluating the impact of environmental impact assessment effect . In addition, in the process of planning implementation, conduct a follow-up assessment of environmental impact across the whole XETDZ2 according to the environmental index system content every 5 years, so as to evaluate whether new environmental impact is produced on the XETDZ2 and put forward more comprehensive remedial measures. Please see table 10-2 for the main review and the content of follow-up assessment on the XETDZ2.

Table 10-2 Main content of follow-up assessment on the XETDZ2

S/N	Item	Work content	Main purpose and significance
1	Environmental monitoring and retrospective assessment	Atmospheric environmental monitoring and retrospective assessment	Master the variation trend of atmospheric pollution
2		Surface water environmental monitoring and retrospective assessment	Master the variation trend of surface water pollution
4		Soil environmental monitoring and retrospective assessment	Master the variation trend of soil pollution
5		Groundwater environmental monitoring and retrospective assessment	Master the variation trend of groundwater pollution
6		Noise environmental monitoring and retrospective assessment	Master the variation trend of noise pollution
7	Investigation of pollution source	Investigation of enterprise pollution source	Master basis data
8		Investigation of enterprise environmental protection measures	
9		Investigation of cleaner production level	
10	Review on environmental protection measures	Ecological protection engineering construction	Effectiveness of environmental protection measures and performance circles
11		Air pollution control	
12		Reclaimed water reuse and water pollution control	
13		Industrial structure and cleaner production	
14		Industrial solid waste disposal	
19	Environmental management	Execution environment of total quantity control	Review and revise all measures of environmental management

13 Communication and Stakeholder Participation

11.1. Public Participation

Public participation has been extensively conducted during the preparation of Environmental Impact Assessment (EIA) and Resettlement Action Plan (RAP), so through which, public concerns have been fully reflected in the EIA/EMP and RAP.

For the purpose of minimizing impacts, communication activities with the affected crowd of Project will continue throughout the Project. The aim of the communications is to provide a two-way information channel, through which Project progress and implementation of EMP can be introduced to the affected community, in this way, can communities's feedback on ongoing Project impacts be timely communicated to the contractor(s) and XETDZ Management Committee.

Contractor(s) are required to disclose information about Project contents, key environmental issues and mitigation measures, according to the recipient's contact way at project construction site for published.

A grievance mechanism is also established under the RAP in response to the public concerns about the land acquisition and livelihood compensation issues and so on.

11.2. Stakeholder Dialogue Mechanism

A stakeholder dialogue mechanism will be established during the Project operation stage. The dialogue mechanism provides a forum to monitor and evaluate the regional development activities, change of ecological environmental status and social development progress of the XETDZ2. The key purpose of such a dialogue mechanism is to make all the relevant agencies and public can know the newest information about the regional development and cumulative environmental and social impacts.

The XETDZ will be responsible for organizing a stakeholder dialogue meeting on a yearly basis. Stakeholders invited include (but not limited to) Anhui Province Environmental Protection Department (AEPD), Xuancheng Environmental Protection Bureau (XEPB), Xuancheng Development and Reform Commission (XDRC), Environmental Protection Branch of XETDZ, representatives from key industrial enterprises around the XETDZ2 and representatives from local communities and villager.

Environmental and ecological monitoring data in XETDZ2 during the Project operation will be fully shared among the stakeholders. The key findings and recommendations from the meeting will be formally communicated to relevant governments in order to take the necessary follow-up actions to ensure a sustainable development of XETDZ2, achieve the integration and harmonization of socio-economic development and ecological functions maintenance.

14 Environmental Training and Capacity Plan

12.1. Construction Training

The XETDZMC shall ensure that all staff is adequately trained prior to developing any activities associated with the XETDZ2 Project. The training will be provided to environmental management staff of XETDZ, ESE and contractors.

Training to XETDZ staffs and ESE

The aim of training to ESE and staffs from XETDZ is to strengthen the environmental management during construction and operation stage and ensure the effectiveness of environmental management so as to improve the overall project quality. Through the training, the ESE and environmental management staff can identify the main environmental problems and defects in environmental management, and cause the contractor so take necessary preventive measures as soon as possible. During construction, the XETDZ will invite the environment consultants with similar experience (environment specialist or environmental institution) to carry out the site training aim to the potential problems and corresponding solutions.

Training to Contractors

Prior to commencement is started, the environmental staffs and workers of the winning bidder shall receive the training on systematic environmental knowledge provided by ESE and XETDZ environmental management team to avoid bringing environmental damages due to operation errors. The training to environmental staffs of contractor(s) is to specify the environmental management liability of constructor(s), the training to workers is to address the issue of correct operation method during construction to reduce or avoid unnecessary damage. Through training, the contractor(s) shall be clearly aware of environmental protection liability undertaken and result possibly caused by environmental damage and the workers were able to clearly understand the protection method and degree of environment-sensitive points, the training to workers shall be for one week based on actual condition.

The training plan with budget estimation as shown in Table12-1..

Table 12-1 Environmental Protection Training Plan

S/N	Trainee	Content	Organizer	Participants	Duration	Place	Budget (RMB)
1	EP Staffs in XEDTZ, ESE	Learn Environmental protection and management knowledge Environmental management measures	XETDZ, IEC	3	5 days	Xuancheng	10,000
2	EP Staffs in XEDTZ	Study visit infrastructural projects mainly paying attention to environmental protection	XETDZ, IEC	3	5 days	Pending	50,000
3	ESE	Relevant provision, Requirement of EMP, Water and soil conservation plan and contingency plan	XETDZ, IEC	10	10 days	Xuancheng	20,000
4	Main technical chief and construction chief of contractor(s)	Relevant provision, Requirement of EMP, Water and soil conservation plan and contingency plan	XETDZ, IEC	30	10 days	Xuancheng	20,000
5	Construction team and people in the same group	Relevant provision, Requirement of EMP, Water and soil conservation plan and contingency plan	XETDZ, IEC	20	3 days	Xuancheng	20,000
Total							120,000

12.2. Environmental Supervision Capability Building

The Development Zone Branch Office under Xuancheng Municipal Bureau of Environmental Protection will be responsible for the environmental management work in the project implementation of XETDZ2 and after the XETDZ2 is completed. Therefore, The capability building of Environmental Protection Branch Office is particularly important. In order to ensure smooth implementation of Project and environmental management of XETDZ2, it is required to promote the capability building of Environmental Protection Branch Office so as to satisfy the requirements of daily environmental management of XETDZ2.

The XETDZ EPB is attached to the Xuancheng EPB with its staff and business under the general management of the Xuancheng EPB. Being a field office of the Xuancheng Municipal EPB, it undertakes the duties of environmental management and supervision within XETDZ jurisdiction. It will carry out the monitoring and supervision tasks during the project construction and operation periods on behalf of the Anhui Provincial EPB, to receive and investigate any local community complaints regarding annoyance due to the construction activities and ensure that the environmental facilities be designed, built and operated together with the project components, and that the environmental facilities would be under normal operation.

12.2.1 XETDZ2 Information

1. Basic information

The Development Zone Branch Office under Xuancheng Municipal Bureau of Environmental Protection is located in XETDZMC. As for administrative aspect, it belongs to Xuancheng Municipal Bureau of Environmental Protection, and it is dual command and established on 20th August, 2007 with approval of No. [2007] 32 document edited by municipal editorial board member and it is ZhengKeJi full funding public institution with approved establishment five people. There are six people now, in which 5 people are enrolled and one is hired driver. There are 2 leadership positions and 2 internal institutions in which 2 people in general management room and 2 people supervision management room. See Table 12-2 for personnel basic information.

Table 12-2 Personnel basic information

Number	Education background	Working years (No.)	Major
1	Postgraduate	25	Environmental protection
1	Undergraduate	5	Law
1	Undergraduate	5	Chemistry
1	Undergraduate	22	Law
1	Undergraduate	1	Chinese
1	Senior high school	5	Driving

2. Law enforcement equipment allocation

There is one state-financed vehicle, evidence-collections equipment has one camera, four desktop computers, one notebook computer, one fax machine and one printer available for Development Zone Branch Office under Xuancheng Municipal Bureau of Environmental Protection.

3. Environmental Management

The Development Zone Branch Office under Xuancheng Municipal Bureau of Environmental Protection is responsible for the environmental management work in three Offices governed by XETDZ such as Feicai, Jinba and Tianhu with area exceeding 200 square kilometers and over 200 supervision of industrial enterprises.

The responsibility of the Development Zone Branch Office is environmental plan, project examination and approval, environmental protection acceptance, authentication management, environmental supervision, standardization control, pollution control, environmental safety, pollution discharge reporting, pollution charges, environmental petition letter, ecological construction, publicity and education, environmental statistics and special action of environmental protection and so on.

4. Problem of daily office occupancy

The development Zone Branch has not house property at present, and they work in the office building of XETDZMC. They borrow three business occupancies from Management Commitment with 100 square meters building area.

12.2.2 Work development

Besides following the Provincial Department and Municipal Bureau work, the daily work is, such as pollution control, environmental supervision, pollution discharge reporting, pollution control, environmental investigations and special action. The main task completed by XETDZ Branch in 2010-2012, please see Table 12-3.

Table 12-3 Tasks finished by the XETDZ Environmental Protection Branch Office in 2010-2012

Item	2010	2011	2012
Project examination and approval (No.)	65	95	77
Environmental protection acceptance (No.)	7	12	8
Environmental protection authentication management (No.)	34	58	29
Petition letter case (piece)	12	15	11
Environmental supervision (time)	240	280	340

12.2.3 Environmental Supervision Capacity Assessment

1. Understaffed

The branch has 6 people at present, and the key emphasis in its work is concentrated on project examination and approval, special examination assigned by the superior, investigations and enterprise service, etc.. Most daily work such as environmental protection acceptance, pollution control and environmental supervision can only alternately be carry out, which can not satisfy the requirements of work. At present, the requirements of environmental supervision is higher and higher, and the supervision content and project such as heavy metal dangerous goods, waste gas and wastewater increase constantly with more rigid requirement. With the construction of XETDZ2, a great many enterprises will settle in soon, and the environmental management and supervision power will be not enough. The branch has not established administrative office, thus the archives administration, receiving and dispatch of files and secretarial service will also be shortage.

2. Transportation shortage

The development zone is in wide range, and the environmental protection work is in grass roots. At present, there is only one car to handle all affairs, which cannot ensure the environmental supervision car.

3. Inadequate regulatory resources

The branch shall set special environmental supervision institution and equip with special purpose vehicle.

4. Adequate work, obtaining evidence and informatization equipment

At present, The office, evidence-collections equipmen and informatization equipment are seriously short, that cannot cope with the environmental supervision work in XCTDZ.

12.2.4 Capacity Building of XETDZ Environmental Protection Branch Office and training plan

According to relevant standardization construction requirement of National Environmental Protection Ministry, combine with the reality of XEDTZ, put forward the following plans in aspect of team construction, equipment construction, business occupancy and personnel training, etc.

1. Environmental Management

Table 12-4 Criteria of team Buidling

Category	S/N	Index content	Criteria	Remarks
Institution and personnel	1	Institution	The environmental protection branch office sets one director general, two deputy director generals and one general engineer. There are office, integrated business management room, propaganda and education information center and environmental monitoring team under it. Organizations are sound and operated formally.	
	2	Personnel scale	15 to 20 the organizational personnel	
	3	Personnel management	Personnel shall employ civil servant management or refer to the national servant management.	
	4	Personnel education background (above junior college)	90%	Excluding service workers
	5	Professional personnel relevant with environmental protection	60%	
	6	Law enforcement officials training rate	100%	It refers to environmental monitoring post training rate.
	7	Law enforcement officials certified rate	100%	It refers to have China environmental monitoring law enforcement certificate.
	8	Function arriving	Basic function can arrive according to the functions ruled by Environmental Protection Ministry	
Foundation work	9	implementation of environmental monitoring work system	Systems are sound, observed and implemented.	

Category	S/N	Index content	Criteria	Remarks
	10	implementation of environmental monitoring work procedure	Integrated and reasonable procedure, simple and practical operation, standardized and orderly implementation.	
	11	implementation of environmental monitoring governmental affairs information submitting system	Submitting according to the requirement of documents.	
	12	Government affairs disclosure systems	Disclosure according to the requirement of article 5.	
	13	File management system	Neat and normative filling in, complete and full data.	
	14	Basic expenditure	All are brought into the financial budget arrangement.	Including personnel salary and daily public funds.
	15	Law enforcement funds	All are brought into the financial budget arrangement.	Including law enforcement funds and law enforcement equipment operating maintenance expenditure.

Table 12-5 Criteria of equipment construction

Category	S/N	Index content	Construction criteria	Standard configuration/selective configuration	
Vehicle	1	Law enforcement vehicle	3 sets	Standard configuration	
	2	Vehicle GPS satellite locator	One set every year		
	4	Vehicle-mounted communication equipment	Meet the job requirement		
	5	Vehicle-mounted office equipment	Meet the job requirement		
	6	Vehicle-mounted sample preservation equipment	Meet the job requirement		
	7	Vehicle-mounted radio station	Meet the job requirement		
	Obtaining evidence equipment	8	Video camera		3 sets
9		Camera	5 sets		
10		Video equipment	2 sets		
11		Imaging equipment(television and DVD player)	2 sets		
12		Handheld GPS locator	3 sets		
13		Range finder	1 set		
14		Flowmeter	2 sets		
15		Acidometer	3 sets		
16		Sound level meter	1 set		
17		Sampling equipment	4 sets		
18		Service with record machine	4 sets		
19		Flue gas and pollutant fast tester	Meet the job requirement	Selective configuration	
20		Personal protective equipment	Meet the job requirement		
21		Dark tube detector	Meet the job requirement		
22	Water quality fast tester	Meet the job requirement			
23	Flue gas backness meter	Meet the job requirement			
24	Dust fast tester	Meet the job requirement			
Communication equipment	25	Telephone	Meet the job requirement	Standard configuration	
	26	Fax machine	One set for each office		
Office equipment	27	Desktop computer	1 set/people	Standard configuration	
	28	Printer	Meet the job		

Category	S/N	Index content	Construction criteria	Standard configuration/selective configuration
			requirement	
	29	Portable printer	2 sets	
	30	Notebook computer	1 set/people	
	31	Duplicator	1 set	
Informatization equipment	32	Pollution discharge expenditure management system	1 set	Standard configuration
	33	Environmental law enforcement management and movable law enforcement system	One system, one movable law enforcement tool box for each car and/or one handheld PDA for each person	
	34	Pollution source online monitoring center	1	
	35	12369 environmental protection report hotline	1 set	

Table 12-6 Criteria of business occupancy

S/N	Index content	Construction criteria	Remarks
1	Office occupancy	Not less than 10 m ² per capital	All are use areas.
2	Law enforcement reception office	Not less than 60 m ²	
3	Evidence-collections equipment room	Not less than 50 m ² , and set small operation room in it.	
4	Record office	Not less than 80m ²	
5	Pollution discharge declaration acceptance office	Not less than 80 m ² , including acceptance area and declaration area.	
6	12369 environmental protection hotline complaint acceptance night duty room	2 rooms, 20 m ² /room	

2. Environmental management capacity training plan

(1) Training purpose

Environmental management training purpose is to ensure smooth and effective development of environmental management work, making relevant personnel know the content and procedure of environmental management, improving the environmental management capacity of environmental managers so as to ensure that all environmental protection work in XETDZ are effectively implemented. .

(2) Training object

The training objects are all personnel of XECTDZ Environmental Protection Branch Office.

(3) Training content

1) Master and apply laws and regulations of environmental protection and environmental criteria;

2) On-job training (OJT) for project examination and approval and environmental monitoring;

3) Training for cleaner production review;

4) Dangerous waste management training;

5) Environmental monitoring training;

6) Emergency capacity training.

(4) Training plan

See table Table -7 for annual training plan.

Table 12-7 Environmental management capacity training plan

Training	Relevant personnel	Content	Times of every year	Days of every time	Cost (RMB ten thousand)
Environmental laws, regulations and policy	All personnel	(1) Environmental laws and regulations (2) Environmental policy and plan (3) Environmental management knowledge	2	2	7
Project examination and approval	Related personnel	Project examination and approval	1	3	5
Environmental monitoring	Related personnel	Environmental monitoring	1	3	5
Cleaner production	Personnel	Cleaner production	1	5	6
Dangerous waste management	Related personnel	Dangerous waste management	1	3	5
Environmental monitoring	Related personnel	Environmental monitoring	1	5	5
Emergency ability	Personnel	Emergency capacity	1	3	5

13 Environmental Protection Investment

The EMP implementation during construction and operation has been budgeted as shown in Table . The total budget of environmental investment includes environmental mitigation measures, environmental protection monitoring, engineering management, main projects and environmental impact mitigation investment. It is noted that many mitigation measures is practical nature, and its budget is included in the integrated contract and may not be appointed.

Table 13-1 List of the Project environmental protection investment

Time interval	Content		Investment (RMB ten thousand)	
			Estimate	Remarks
Construction period	Social environment	Media, Advance notice	10	
		Billboard in construction site	12	
	Water and soil conservation	Borrow earth, spoil piled up maintenance	2726.6	Implementation in accordance with water and soil preservation proposal
		Recovery of damaged vegetation		
		Soft cover treatment of stockpile		
		Monitoring	44.8	
	Atmosphere	Sprinkling	20	Equipped with sprayer.
		Monitoring	10	
	Noise	Set noise reduction facilities such as temporary noise barrier.	5	-
		Monitoring	5	
	Wastewater	Construction wastewater treatment	20	Set sedimentation tank.
		Monitoring	5	
	Solid waste	Spoil disposal	120	Transportation to appointed spoil area.
		Domestic garbage treatment	5	Collection and transportation to the sanitation landfill
		Environmental monitoring in construction period	260	
		Independent Environmental Management Consultant	150	
	Unforeseeable	170		
	Total	3753.4		
Operating period	Ecological compensation	Greening	260	The green area is calculated according to 25% of floor area.
	Atmosphere	Prevention measure	50	Stink control measures of WTP, refuse transfer station and public toilet.
		Monitoring (first year)	10	
	Noise	Noise abatement	30	Noise control measures of WTP, refuse transfer station and lifting pumping station.

		Monitoring (first year)	5	
	Wastewater	Wastewater treatment	20	Collection facilities of refuse leachate.
		Monitoring (first year)	5	
	Unforeseeable		19	
	Total		399	
Training			50	
Total				4033.4
Proportion in total investment (%)				1.56