

Environmental Management Plan

April 2017

PRC: Xinjiang Changji Integrated Urban-Rural Infrastructure Demonstration Project

Prepared by Changji Hui Autonomous Prefecture Government for the Asian Development Bank.

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ATTACHMENT 1: ENVIRONMENT MANAGEMENT PLAN (EMP)

A. Introduction

1. This Environmental Management Plan (EMP) is developed for the Xinjiang Changji Integrated Urban-Rural Infrastructure Demonstration Project (the project) and defines all potential environmental impacts of the project components and the mitigation and protection measures with the objective of avoiding or reducing these impacts to acceptable levels and meeting applicable requirements. The EMP draws on the findings of the domestic FSR, domestic environmental impact assessments, the initial environmental examination (IEE), PPTA and ADB review mission discussions, and agreements with the relevant government agencies.

2. The EMP sets out (i) actions to implement mitigation measures; (ii) a monitoring and reporting program; (iii) institutional/organizational arrangements; (iv) capacity development and training; (v) an implementation schedule; and (vi) cost estimates. The final EMP forms part of the Project Administration Manual (PAM) and will be included as a separate annex in all bidding documents. The contractors will be made aware of their obligations to implement the EMP, to budget EMP implementation costs in their bids, and to develop site management plans which are fully responsive to the EMP.

B. Institutional Arrangement

3. Xinjiang Uygur Autonomous Regional Government (XUARG) will be the project's Executing Agency (EA). The IAs will be Fukang City Government, Hutubi County Government, and Qitai County Government. The Project Management Office will be the Changji Hui Autonomous Prefecture Government (CPMO) under the Changji Prefecture Housing and Urban & Rural Construction Bureau, will be responsible for project implementation and coordination with ADB. There will be three county/city level PMOs: Fukang City Government (FPMO), Hutubi County Government (HPMO), and Qitai County Government (QPMO). These will also be the Implementing Agencies.

4. Each project component will have its own Project Implementation Unit (PIU) within the IA, to undertake design, construction and operation.

5. A provincial Project coordinating Group will be constituted. It will be chaired by the Xinjiang Department of Housing and Urban-Rural Development and comprise representatives of relevant departments. Its role will be to ensure smooth passage of project approvals and administration as well as coordinating policy response when required.

6. The main institutions with an executive role in the implementation of the overall project are in Table A1.2. Their roles and responsibilities for environmental management are also listed

Table A1.1: Roles and Responsibilities of Project Agencies

Project implementation organizations	Roles and Responsibilities in the Project	Environmental Responsibilities
Executing Agency – XUARG	Overall project guidance, coordination, supervision	Providing executive direction and for the implementation of environmental management
PCG – provincial Project Coordinating Group: Departments of Housing and Urban-Rural Development,	Policy guidance and interagency coordination	Coordinating role where the responsibilities of different agencies overlap or are required (e.g. in GRM resolutions)

Project implementation organizations	Roles and Responsibilities in the Project	Environmental Responsibilities
Planning and Construction, and Environment Protection		
CPMO under the Changji Prefecture Housing and Urban & Rural Construction Bureau	On behalf of the executing agency, responsible for overall project coordination and supervision including: preparation and implementation; coordinate training and capacity development activities; safeguards compliance; prepare and submit annual environmental and social safeguard monitoring progress reports; compliance with loan and project agreements	Overall supervision of the implementation of environmental impact mitigation measures, coordinating the project level Grievance Redress Mechanism (GRM) and environmental monitoring reporting to ADB
City/County PMOs: Fukang City Government (FPMO), Hutubi County Government (HPMO), and Qitai County Government (QPMO)	Responsible for day-to-day project coordination and supervision at the local level, including: component preparation and implementation; safeguards compliance; and progress reports	
Implementing Agencies: Fukang City Government (FPMO), Hutubi County Government (HPMO), and Qitai County Government (QPMO).	Implementing agencies will be the project implementing units for construction and the operations and maintenance units for the subprojects.	

C. Environmental Responsibilities

7. **PMO.** The CPMO will have the overall responsibility delegated by the EA for supervising the implementation of environmental impact mitigation measures, coordinating the project level Grievance Redress Mechanism (GRM) and environmental monitoring reporting to ADB. The CPMO will appoint an environment officer (PMO-EO) to supervise the effective implementation of the EMP and to coordinate the GRM. Terms of reference for the PMO-EO are at Annex A.

8. To ensure that the contractors comply with the EMP provisions, the PMO-EO with the help and technical support of the Loan Implementation Environment Consultant (LIEC), will prepare and provide the following specification clauses for incorporation into the bidding procedures: (i) a list of environmental management and monitoring requirements to be budgeted by the bidders in their proposals; (ii) environmental clauses for contractual terms and conditions; and (iii) in the EMP. In addition, the PMO-EO will assist in preparing the environmental sections for the project progress reports.

9. **IAs.** Each IA with civil works will assign one environmental supervisor from the IA (IA-ES) to (i) review and approved contractors' site management plans; (ii) supervise the environmental performance of the component PIUs; (iii) participate in internal monitoring; (iv) act as a local entry point for the project grievance redress mechanism (GRM); (v) submit quarterly inspection results to the contractors for information, and to the IA and the PMO for verification and confirmation. Terms of reference for the IA-ES positions are at Annex C. The IAs will also hire construction supervision companies (CSCs), which will support the IAs in supervising construction works.

10. **Construction Contractors** will be responsible for implementing the mitigation measures

during construction under supervision of the IAs and the County/City PMOs. In their bids, contractors will be required to respond to the environmental management requirements defined in the EMP. Each contractor will be required to develop Site Management Plans and will assign a person responsible for environment, health and safety. The contractors, in collaboration with the IA-ESs, will undertake internal monitoring.

11. **Loan Implementation Environmental Consultant (LIEC).** Under the loan implementation consultancy services, a loan implementation environmental specialist will be recruited to support the effective implementation of the EMP. Terms of reference for the LIEC are at Annex B. The LIEC will:

- i) assess the subprojects' environmental readiness prior to implementation based on the readiness indicators defined in the EMP (Table A1.4);
- ii) update the EMP including mitigation measures, monitoring program, institutional arrangements, and training plan as necessary, to reflect the final project scope and detailed design, submit to ADB for review and disclosure;
- iii) support the EA, PMOs, and IAs to ensure that the bidding documents and civil works contracts contain provisions requiring contractors to comply with the mitigation and monitoring measures in the EMP and that relevant sections of the project EMP are incorporated in the bidding and contract documents;
- iv) support the PMO-EO and IA-ESs in reviewing and approving contractors' Site Management Plans and conducting periodic environmental site inspections;
- v) Assist the EA and CPMO to establish a Grievance Redress Mechanism (GRM), and provide training for the County/City PMOs and GRM access points.
- vi) Monitor implementation of, and compliance with, EMP requirements. Undertake site visits as required, identify any environment-related implementation issues, propose necessary corrective actions, reflect these in a corrective action plan;
- vii) Conduct annual EMP compliance review;
- viii) support to the PMO-EO in the development of annual EMP monitoring reports to ADB;
- ix) provide training to PMOs, IAs and contractors on environmental laws, regulations and policies, SPS 2009, EMP implementation, and GRM in accordance with the training plan defined in the EMP.

12. An External Monitor will be contracted by the PMO to review and evaluate the results of the contractors' and operators' internal monitoring and the results of the EMS monitoring against PRC standards. The External Monitor will report to the ADB separately from the PMO's Environmental Monitoring Reports. Terms of reference for the PMO-EO are at Annex D. Overall environmental responsibilities of the agencies and positions are outlined in Table A1.2.

Table A1.2: Environmental Responsibilities by Project Phase

Phase	Responsible Agencies	Environmental Responsibilities
Detailed Design	Design institutes	Incorporation of environmental mitigation measures in detailed designs
	CPMO, IAs, LIEC	Update EMP based on detailed design, if necessary;
	ADB	Approve updated EMP, if necessary

Tendering	County/City PMOs, IAs	Ensure that mitigation measures and the EMP clauses are incorporated in tendering documents, civil works contracts and contractors' site EMPs
	LIEC, ADB	Review tendering documents; confirm project's readiness, including information disclosure at construction sites
Construction	Contractors	Develop Site Management Plans; appoint one environmental specialist each to coordinate site EMP implementation; ensure health and safety
	CPMO and County/City PMOs	Coordinate GRM; supervise EMP implementation; prepare environmental progress sections (with support of LIEC)
	IAs and PIUs (CSCs)	Assign one environmental supervisor (ES); conduct environmental inspections; prepare quarterly environmental inspection reports; act as local GRM entry point
	LIEC	Advise on the mitigation measures; provide comprehensive technical support to PMO and IAs for environmental management; conduct training; conduct annual EMP compliance review; support to the PMO-EO in the development of annual EMP monitoring reports to ADB.
	ADB	Disclose updated EMP as appropriate; Conduct review missions; review and approve environmental progress sections of the project progress reports, including disclosure. Review EMP implementation reports.
	EMSs	Conduct periodic inspections of all construction projects relative to compliance with PRC regulations and standards (as required by the Monitoring Plan)
	External Monitor	Review and evaluate internal and EMS monitoring.
Operation	CPMO	Monitor compliance with EMP, instruct IAs on environmental management requirements; prepare annual environmental progress report for first year of operation
	IAs (O & M Units)	Implementation of mitigation measures as defined in EMP
	ADB	Review, approve and post annual EMP implementation reports on ADB project website

ADB = Asia Development Bank; DI = Design Institute(s); LIEC = Loan Implementation Environmental Consultant; CPMO = Changji Project Management Office; EA = Executive Agency; IA = Implementing Agency; EMP = Environmental Management Plan; EPB = Environment Protection Bureau; PIU = Project Implementation Unit; O & M Units = Operations and maintenance Unit.

D. Impacts and mitigation measures

13. Anticipated environmental impacts from elderly care infrastructure construction and operation activities, as well as the measures to mitigate these impacts to acceptable levels, are listed in A1.3.

Table A1.3: Anticipated Impacts, Issues and Mitigation Measures

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
A. Pre-construction								
1. Detailed Design Stage	Ensure appropriate levels of expertise for EMP implementation	Establish implementation support positions	<ul style="list-style-type: none"> - Contract a Loan Implementation Environmental Consultant (LIEC)); - Contract Environmental Monitoring Station for external monitoring of construction and operations. - Contract External Monitor 	CPMO, IAs	EA, ADB	PMO and AIs in-kind support. LIEC included in loan funds EMS costs in Monitoring Plan Table A1.6		
		Establish environmental staff positions at different levels of supervision	<ul style="list-style-type: none"> - Appoint PMO Environment Specialist (PMO-ES) - Appoint IA Environment Specialists (IA-ES) in the IAs 	CPMO, IAs	EA, ADB	PMO and AIs in-kind support.		
	Closure of existing landfill (Qitai)	Potential pollution and contamination source for the future	<ul style="list-style-type: none"> - Prepare and implement detailed plans to close and rehabilitate the existing landfill at Lama Huliang in compliance with the Standard for Pollution Control of Landfill for Domestic Waste (GB16889-2008) and the residual leachate be treated to comply with the same standard. 	Qitai IA	PMO	-	-	Included in design costs
	Design finalization	Inclusion of all environmental requirements	<p>Finalize detailed designs for all infrastructure. Including, for solid waste management:</p> <ul style="list-style-type: none"> - the design of transfer station to wholly contain the solid waste without leakage and in a secure, fenced area which will be emptied on a regular schedule. - fencing around the landfill to prevent waste from spreading during windy or rainy weather - transfer station maximum capacities, collection schedules and haulage routes to landfill <p>Including for Roads components:</p> <ul style="list-style-type: none"> - dense landscape planting and earthen or fabricated noise barriers along roadside for urban areas within 80-100m of curb of Urumqi Road and within 60 m of Bajiahu Road (Qitai) - dense landscape planting and earthen or fabricated noise barriers for urban areas within 60-65 m of curb of Tianshi and 	IAs, LDI	PMO	Included in LDI contract	Included in LDI contract	Included in LDI contract

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
			<p>Tianshan Roads (Fukang)</p> <ul style="list-style-type: none"> - constructed noise barriers and double glazing for roadside adjacent to hospital on Honglingjin Road (Ganhezi). <p>Including for TVET component:</p> <ul style="list-style-type: none"> - development and implementation of a solid waste and hazardous substances plan which includes storage, handling and disposal protocols. - Inclusion of environmental management in curricula. 					
	Inclusion of all requirements for adaptation to climate change in the CRVA into designs.		<p>Finalize detailed designs for all infrastructure.</p> <ul style="list-style-type: none"> - Include all agreed climate change adaptation design measures in final design, including: - Road bridges and culvert design for 1:100 year flood plus 6% - Road surface drainage for a 1:5 year storm event - Siting of pipelines to avoid high velocity runoff - Leachate holding tank at landfill for 90-120 days - Use of drought tolerant species as core areas (30%) of windbreaks and shelterbelts 	IA, LDI	PMO	Included in LDI contract	Included in LDI contract	Included in LDI contract
	Confirm seasonal water availability for irrigation of urban roadside landscaping		<ul style="list-style-type: none"> - For urban road landscaping in Hubuti, Ganhezi and Qitai, undertake seasonal water balances to ensure that there is sustainable water supply from local sources for irrigation and that other water users are not disadvantaged. 	IA, LDI	PMO	Included in LDI contract	Included in LDI contract	Included in LDI contract
	Water safety planning		<ul style="list-style-type: none"> - For the sources, supply and distribution of water from No.3 WTP in Qitai, prepare a Water Safety Plan in compliance with WHO guidelines to ensure water quality at all stages of conveyancing and distribution. 	IA, LDI	PMO, LIEC	-	-	60,000
	Protection of watersheds		<ul style="list-style-type: none"> - Protection measures for the watershed of Biliu and Zhonggegen reservoirs will be formally delineated for water source protection zones and the zones enforced. These comprise: (i) a Prohibited Zone (Grade I Zone), closest to the water source; and (ii) a Protection Zone (Grade II Zone), adjoining the Prohibited Zone. 	CHAPG WRB	PMO and LIEC	-	-	Ongoing government role

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
	Detailed building design incorporating appropriate standards and safeguard measures	Design of TVET to comply with relevant applicable health, safety and environmental codes and standards, including energy-efficient building codes and specifications.	<ul style="list-style-type: none"> - Design buildings in compliance with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50011-2010 (Building Seismic Design Code); GB 50016-2006 (Code of Design on Building Fire Protection and Prevention); GB 50189-2005 (Energy Conservation Design for Public Buildings) 	Dis	IAs, LIEC	Included in design costs	Included in design costs	Included in design costs
	Acquisition of land and assets for project construction	Resettlement Plans (RP)	<ul style="list-style-type: none"> - Update RPs for each project output to required ADB and PRC standards. - Establish a resettlement office comprising local government officials to manage the resettlement process. - Conduct community consultation programs and ensure information is disseminated about entitlement based on the Land Administration Law. - Ensure that all relocation and resettlement activities are completed before construction starts on any subproject. 	PMO, IAs	External Resettlement Monitor	Included in the RP (financed by XUARG)		
2. Construction preparation stage	Prepare final version of environmental management measures	Update EMP	<ul style="list-style-type: none"> - Review/revise EMP to assess if the current mitigation measures need to be updated due to any changes in the final engineering design, or as a result of any preparatory work undertaken before loan agreement. For changes in project locations, sites, or other changes that may cause new or greater environmental impacts or involve additional affected people: - Where project components change in scale or location, the PMO will conduct additional environmental assessment and public consultation. - The revised environmental assessment reports will be submitted to the PMO, EPB and ADB for approval and disclosure. 	PMO-ES, IAs-ES, LIEC	PMO, ADB,	PMO in-kind support, included in loan cost		

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
		Bidding documents and contractors	<ul style="list-style-type: none"> - Translate EMP into Chinese and distribute to all parties - Contract a Tendering Agency to ensure that the provisions of this EMP are included in bidding documents; - Include an environmental section in the technical specifications for bidders which lists EMP requirements; - Ensure that construction contracts are responsive to EMP provisions and that mitigation and monitoring measures are adequately budgeted. 	Dis, IA-ES, LIEC	EA, PMO, ADB	Included in design costs	Included in design costs	Included in design costs
	Providing a formal, project-specific scheme for complaints to be received and addressed.	Grievance Redress Mechanism (GRM)	<ul style="list-style-type: none"> - Establish GRM in the PMO and establish local access points; - Brief and provide training to GRM access points; Disclose GRM to affected people before construction begins through signage, web sites and notices in community centers. 	PMO-EO IA-ES LIEC	EA, ADB	EMP costs 10,000	EMP costs 10,000	EMP costs 10,000
						PMO: 15,000 (central coordination and record-keeping)		
	Planning for borrow and spoil disposal	Unauthorized and unmanaged use leading to land degradation	<ul style="list-style-type: none"> - All borrow pits, quarries and spoil disposal sites to be used during construction will be identified and approved by the PMO-EO. 	IAs	PMO	Included in design costs	Included in design costs	Included in design costs
	Planning for construction waste management	Unauthorized and unmanaged disposal	<ul style="list-style-type: none"> - Before construction commences, sites for demolition and areas where previous demolition has left building rubble on the surface will be checked for asbestos and lead. - Before construction commences, the anticipated amounts and nature of all wastes should be quantified and disposal sites with the capability of accepting the waste identified. 	IAs	PMO	Included in design costs	Included in design costs	Included in design costs
	Ensuring that staff of entities with environmental responsibilities are able to discharge them with	Training	<ul style="list-style-type: none"> - Provide training to PMO, IAs and contractors on implementation and supervision of EMP, GRM, reporting, in compliance with training plan. - Provide training to facility operators on operational environmental management. 	LIEC and LIC specialists	EA, ADB	EMP Training costs 40,000 Table A1.8	EMP Training costs 40,000 Table A1.8	EMP Training costs 40,000 Table A1.8

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
	understanding. Ensuring that each construction site has an overarching plan for environmental management.	Site Management Plans	<ul style="list-style-type: none"> - Develop Site Management Plans (SMP), responding to (i) all relevant clauses and requirements of this EMP; and (ii) including Occupational and Community Safety Plans and Emergency Response Plans and work schedules. - Assign onsite environment engineer (OEE); - IAs and PMO review and approve each SMP 	Contractor, IA-ES	PMO-EO, LIEC	Included in construction costs	Included in construction costs	Included in construction costs
		Sensitive receptors	<ul style="list-style-type: none"> - At each planned construction site, locate and identify nearby sensitive receptors, including all mosques, for noise and dust impacts, and include them in the Site Management Plan for the implementation of temporary mitigation measures. Confirm ambient noise levels at these locations. - This must include for Hubuti: Hufang and Zhuang villages; for Fukang: Guangyuan Road school, and residences along Tianshi, Tianshan Roads; for Ganhezi: Honglingjin Road hospital, and residences along Guangming and Changqing Roads. 	Contractor, IA-ES	PMO-EO, LIEC	Included in construction costs	Included in construction costs	Included in construction costs
B. Construction								
1 Soil loss and stability	Excavation, earthworks, and site preparation (all components)	Soil erosion and sedimentation	<ul style="list-style-type: none"> - Prepare soil erosion control plan (showing how runoff will be controlled at site perimeter to control soil and water runoff, and how disturbed areas will be reclaimed) as part of the Site Management Plans; - Construct interception ditches and drains to prevent runoff entering construction sites, and to divert runoff from sites to existing drainage. Regularly clean and maintain ditches. - Limit construction and material handling during periods of rains and high winds. - Stabilize all cut slopes, embankments, and other erosion-prone working areas while works are going on. - All earthwork disturbance areas shall be stabilized within 30 days after earthworks have ceased at the sites. - Preserve existing vegetation where no construction activity is planned.; 	Contractor	IA-ES, CSCs LIEC	Included in construction costs	Included in construction costs	Included in construction costs

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
			- Contour and re-vegetate disturbed surface					
	Use of borrow pits and quarries (all components)	Soil erosion and sedimentation	<ul style="list-style-type: none"> - Use only official sites operated and managed by the local Construction Bureau - Avoid sites with known contamination and/or erosion problems 	Contractor and pit operator	IA-ES, PMO	Included in construction costs	Included in construction costs	Included in construction costs
	Use of spoil disposal sites (all components)	Soil erosion and sedimentation	<ul style="list-style-type: none"> - Use only spoil disposal areas operated and managed by the local Construction Bureau 	Contractor and site operator	IA-ES, PMO	Included in construction costs	Included in construction costs	Included in construction costs
	Shelterbelt and windbreak establishment (Fukang shelterbelt component)	Soil instability and slope erosion	<ul style="list-style-type: none"> - On sloping lands, all preparation for plantations must be conducted according to technical specifications of soil and water conservation for sloping land set in <i>Soil and Water Conservation Law of PRC (2010)</i>. - Soil tillage on terraces must be carried out along contours, keeping any existing vegetation between contour terraces to prevent soil erosion. 	IAs, contractors	PMO	Included in construction contracts	-	-
2 Hazardous Materials	Use of fuels and lubricants on site; spill accidents; and production of construction wastes (all components)	Soil and water contamination	<p>Site planning, management and safeguards (in the SMP) to include:</p> <ul style="list-style-type: none"> - Storage facilities for fuels, oil, and other hazardous materials within secured areas on impermeable surfaces, and provided with bunds and cleanup installations; - Fuel supplier is properly licensed and follows the proper protocol for transferring fuel, and complies with JT 3145-88 (Transportation, Loading and Unloading of Dangerous or Harmful Goods). - Vehicles and equipment are properly parked in designated areas to prevent contamination of soil and surface water. - Vehicle, machinery, and equipment maintenance and refueling are carried out so that spilled materials do not seep into the soil or into water bodies. - Fuel storage and refilling areas are located at least 300 m from stormwater drains, rivers and tributaries. - Oil traps for service areas, and parking areas. 	Contractors	CSC, IAs, PMO	Included in construction contracts 70,000	Included in construction contracts 50,000	Included in construction contracts 100,000
3 Surface and Groundwater	Runoff from water used in construction processes, and	Pollution of surface and groundwater resources	<p>Site planning, management and safeguards (in the SMP) to include:</p> <ul style="list-style-type: none"> - Interception of all construction wastewater and site runoff water 	Contractors	CSC, IAs, PMO	Included in construction contracts	Included in construction contracts	Included in construction contracts

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
	rainwater runoff from site. (all components)		<ul style="list-style-type: none"> - Sediment from construction wastewater and site runoff water to be separated in sedimentation traps before discharge of water - Sediment to be disposed at landfill - Site runoff water containing hazardous and harmful materials (see below) to be treated separately from site runoff. 			150,000	120,000	200,000
		Petrochemical pollution of surface and groundwater resources	Site planning, management and safeguards (in the SMP to include: <ul style="list-style-type: none"> - Servicing, refueling and long-term parking of machinery on bunded hardstanding with drains; - Drains to be equipped with oil/water separators. 					
	Runoff from water used in domestic processes. (all components)	Pollution of surface and groundwater resources	<ul style="list-style-type: none"> - Contractor to provide portable toilets at construction sites. Toilets to be emptied regularly and sewage transported to WWTP. 	Contractors	CSC, IAs, PMO	Included in construction contracts 40,000	Included in construction contracts 20,000	Included in construction contracts 60,000
4 Solid waste	Solid waste accumulation from demolition, concrete formwork, packing and surplus building materials (road components)	Safety hazard and site management inefficiencies from waste accumulation. Reduction of neighborhood amenity from inappropriate disposal	<ul style="list-style-type: none"> - Install confined storage points of solid wastes away from sensitive receptors, regularly haul to an approved disposal site; - Use licensed contractors to remove wastes from the construction sites; - Prohibit burning of waste. - Provide appropriate waste storage containers for workers' municipal garbage and hazardous wastes. - If the pre-construction check has identified asbestos or lead, licensed contractors will be engaged to manage disposal. 	Contractor	IA-ES, CSCs, LIEC	Included in construction contracts 30,000	Included in construction contracts 20,000	Included in construction contracts 40,000
5 Noise	Use of construction machinery on site and haulage vehicles bringing or removing materials (all components)	Noise impacts from construction activities	<ul style="list-style-type: none"> - Maintain equipment and machinery in good working order; undertake regular equipment maintenance, ensure compliance with PRC standard of GB12523-2011; - Operate between 0800H-2000H only and reach an agreement with IAs management and nearby residents regarding the timing of heavy machinery work, to avoid any unnecessary disturbances; nighttime works should only be conducted in exceptional cases, and a permit should be obtained for that purpose; 	Contractor	IA-ES, CSCs, LIEC	Included in construction contracts 120,000	Included in construction contracts 70,000	Included in construction contracts 60,000

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
			<ul style="list-style-type: none"> - Inform potentially affected people including nearby residents, through advanced meaningful consultations; - When work is planned near sensitive receptors, residents will be notified by the IA and/or contractors and any site-specific concerns or working arrangements addressed. - Prohibit noise-generating construction work between 2000 and 0600 hours. - Avoid minority religious activities or festival (i.e., no construction allowed within 500 meters of any mosques during Friday prayer times, or during Muslim festivals). - If construction noise needs to continue into the night, the contractor must first consult with the PMO, IA, and local communities and obtain their agreement. - Identify sensitive receptor sites within 100m of construction (schools, medical centers) and erect temporary noise barriers to reduce noise impact on them; - Locate sites for concrete-mixing and similar activities on the site at the point furthest from any sensitive receptors and equip with noise barriers to ensure noise at boundaries complies with GB12523-2011; - Disseminate information on procedure of handling complaints through the Grievance Redress Mechanism (GRM). 					
6 Ambient Air	Wind-blown fugitive dust from unstabilized surfaces; dust from unloading and spreading soils and gravels; dust raised by haulage truck wheels and blowing off truck loads. (all components)	Dust pollution generated during construction	<ul style="list-style-type: none"> - Transport containers and vehicles carrying soil, sand or other fine materials to and from the sites must be covered. - Materials storage and stockpile sites are covered or sprayed with water. - Water is sprayed on bare earth surfaces at construction sites and access roads twice daily. - All roads and tracks used by vehicles of the contractors or any subcontractors or supplier are kept clean and clear of all dust, mud, or extraneous materials dropped by vehicles.; - Regularly consult nearby residents to identify 	Contractor	IA-ES, CSCs, LIEC	Included in construction contracts 100,000	Included in construction contracts 50,000	Included in construction contracts 120,000

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
			concerns, and implement additional dust control measures as necessary.					
	Use of petrol and diesel engines on site. (all components)	Air emissions from construction vehicles and machinery	<ul style="list-style-type: none"> - Maintain vehicles and construction machineries to National V emission standard (MEP 2016). 	Contractor	IA-ES, CSCs, LIEC	Included in construction contracts 35,000	Included in construction contracts 25,000	Included in construction contracts 40,000
7 Physical cultural resources	Earthworks, site leveling and trenching. (all components)	Damage to known or unknown above or below-ground cultural relics	<ul style="list-style-type: none"> - Establish chance-find procedures for physical cultural resources; - If a new site is unearthed, work must be stopped immediately and the IA and local cultural relic bureau promptly notified, and construction will resume only after a thorough investigation and with the permission of appropriate authority. 	Contractor	IA-ES, CSCs, LIEC	Included in construction costs	Included in construction costs	Included in construction costs
8 Health and Safety	All construction worker activities, ranging from building works and domestic living. (all components)	Occupational Health and Safety	<ul style="list-style-type: none"> - Construction site operations must comply with PRC State Administration of Worker Safety Laws and Regulations. - Provide safe supply of clean water and an adequate number of latrines and other sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained in a hygienic state; - Provide garbage receptacles at construction site; - Provide personal protection equipment (PPE) for workers in accordance with relevant health and safety regulations; - Develop an emergency response plan to take actions on accidents and emergencies; document and report occupational accidents, diseases, and incidents; organize fully equipped first-aid base at each construction site (part of Site Management Plan); - Establish Records Management System that will store and maintain easily retrievable records on occupational accidents, diseases, and incidents. - Train all construction workers in basic sanitation and hygiene issues, general health in basic sanitation and hygiene issues, general health and safety matters, and on the specific hazards of their work; - Posters drawing attention on site safety, 	Contractor	IA-ES, CSCs, LIEC	Included in construction contracts 50,000	Included in construction contracts 40,000	Included in construction contracts 70,000

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
			rescue and industrial health regulations shall be made or obtained from the appropriate sources and will be displayed prominently in relevant areas of the site.					
	Community activities at or around the site – pedestrians, vehicle drivers and passengers, and people accessing site. (all components except Qitai landfill)	Community Health and Safety	<ul style="list-style-type: none"> - At all times during construction, safe and convenient passage must be given for community vehicles, and pedestrians to and from side roads. - Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warnings. - At the end of each day, all sites and equipment will be made secure (through fencing and/or lock-down of equipment) to prevent public access. - Assign personnel to direct pedestrians around dangerous work areas; - Ensure that all sites are secure, discouraging access through appropriate fencing; place clear signs at construction sites in view of the people at risk (including workers and nearby communities), warning people of potential dangers such as moving vehicles, hazardous materials, excavations, and raising awareness on safety issues; - Erect safety barricades around all excavations; - Return machinery to its overnight storage area/position; - Return machinery to its overnight storage area/position; - Hold a public consultation meeting prior to commencing construction to discuss issues associated with ensuring the safety of nearby communities in vicinity of the construction site. - Plan and manage unavoidable utility services disruption and ensure public is adequately informed about interruptions. 	Contractor	IA-ES, CSCs, LIEC	Included in construction contracts 100,000	Included in construction contracts 40,000	Included in construction contracts 60,000
	Installation of natural gas pipes beneath roads (road components)	Community Health and Safety	<ul style="list-style-type: none"> - The contractors will prepare the site, construct pipelines and close the site in compliance with the PRC Technical Code for Gas Pipe Design (GB 50028-2006) and Technical Code for Construction and 	Contractor and IA	PMO, LIEC	Included in construction costs	Included in construction costs	Included in construction costs

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
-	Traffic disruption (road components)	Community Health and Safety	Acceptance Inspection (CJJ33-2005). - Implement traffic control plan within and around project site and/or communities during construction, to be approved by local traffic management administration. The plan shall include provisions for diverting or scheduling construction traffic to avoid peak traffic hours, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signage	Contractor and IA	PMO, LIEC	Included in construction costs	Included in construction costs	Included in construction costs
Unexpected environmental impacts	All site preparation and construction activities (all components)	Impacts and environmental risks not covered in IEE and EMP	- If unexpected environmental impacts occur during project construction phase, immediately inform the PMO; assess the impacts; and update the EMP	IA	PMO, LIEC	Included in construction costs	Included in construction costs	Included in construction costs
C. Operation								
Road Components								
1 Noise and air	Traffic impact increases above prediction	Noise and dust affecting nearby residents	- In the first 3 years of operation, monitor traffic volumes, air pollution and noise to ensure the continued effectiveness of designed protection measures for sensitive receptors. - Construct/extend noise barriers as required.	O & M Unit, Traffic Bureau	PMO, ADB	Operating costs and operational contingency	Operating costs and operational contingency	Operating costs and operational contingency
		Vehicle emissions	- Vehicle testing for compliance with emission standards	O & M Unit, Traffic Bureau	PMO, ADB	Operating costs and operational contingency	Operating costs and operational contingency	Operating costs and operational contingency
2 Water	Road surface drainage	Excessive pollutants in road drainage water	- In the first 3 years of operation, monitor quality of water from road drainage for contaminants - Install silt and oil traps as appropriate.	O & M Unit, Traffic Bureau	PMO, ADB	Operating costs and operational contingency	Operating costs and operational contingency	Operating costs and operational contingency
3 Community safety	Natural gas pipes under roads	Maintenance and safety of gas pipes	- Strictly follow (i) the Technical Manual on Urban Gas Facility Operation, Maintenance and Safety (CJJ51-2016), issued by Ministry of Housing and Urban-rural Development, and (ii) emergency procedures for pipe failure or road failure in the National Regulation on Urban Gas Supply Management (2016 amended, issued by State Council), which includes procedures for emergency response.	Xinjiang Meicheng Gas Limited Company, Roads O & M Unit, Traffic Bureau	PMO, ADB	Operating costs and operational contingency	Operating costs and operational contingency	Operating costs and operational contingency
	Piped connections to centralized heating networks	Dismantling and disposal of small boilers	- The future demolition of superseded small heating boilers will be undertaken in compliance with the guideline for industrial solid waste storage and	CHAPG	PMO, ADB	Ongoing government role	Ongoing government role	Ongoing government role

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
			disposal (GB18599-2011).					
Water Supply Pipeline Component								
1 Water	Supply of good quality water	Deterioration of watershed	- Protection measures for the watershed of Biliu and Zhonggegen reservoirs will be enforced for water source protection zones and the zones enforced. These comprise: (i) a Prohibited Zone (Grade I Zone), closest to the water source; and (ii) a Protection Zone (Grade II Zone), adjoining the Prohibited Zone.	CHAPG WRB	PMO and LIEC	-	-	Ongoing government role
		Connections to end-users	- Qitai County Water Supply and Drainage Management Department will complete the water distribution connections to end users in a timely manner.	CHAPG Qitai WSDMD	PMO and LIEC	-	-	Ongoing government role
Shelterbelt and Windbreak Components								
1 Ecology and land management	Plantation forest management	Success of plantations	- Shelterbelt forests will require intensive management during the establishment phase and silvicultural management later. The project's capacity building and training will address proper fertilizer and pesticide use.	O&M Unit	IA, PMO	Management-included in operating costs.	-	-
Solid waste Component								
1 Water	Groundwater quality (landfill)	Contamination of groundwater by leachate	- To ensure that leachate is not penetrating into the groundwater, a monitoring program will be implemented (see details in the EMP). Continuous groundwater monitoring will be carried out during operation.	O&M Unit	IA, PMO	-	-	Included in monitoring costs (Table A1.7) Included in design and operating costs
			- Leachate holding tanks will be designed for 2 weeks' storage of leachate in the event of plant malfunction. In the event of longer malfunctions, the collected leachate will be back-pumped onto the landfill to obtain leachate volume reduction and leachate fixing.					
			- Scheduling working hours and transportation routes for garbage collection and disposal, avoiding urban traffic peak period and sensitive location; - Selecting low noise equipment and vehicles in the acquisition of machines and vehicles.					
	Noise (landfill)	Disturbance of residents during garbage collection and transfer	- Scheduling working hours and transportation routes for garbage collection and disposal, avoiding urban traffic peak period and sensitive location; - Selecting low noise equipment and vehicles in the acquisition of machines and vehicles.	O&M Unit	IA, PMO	-	-	Included in design and operating costs
	Fugitive garbage (landfill)	Contamination of surrounding landscape by	- All haulage vehicles will be covered, and progressively enclosed as the fleet is modernized.	O&M Unit	IA, PMO	-	-	Included in design and operating

Item/Media	Activity	Impacts, risks and issues	Mitigation Measures	Measures implemented by	Implementation of measures checked by	Budget source and estimate (CNY)		
						Fukang	Hubuti	Qitai
		garbage	<ul style="list-style-type: none"> - Retaining fences will be erected around the landfill site to prevent the waste from spreading during windy or rainy season. 					costs
	Landfill gas (CH ₄)	Health and safety of landfill workers and community	<ul style="list-style-type: none"> - Collection of methane gas from decomposing garbage will be channeled through a specially constructed gas collection system comprising gas transmitting gabions, collecting pipes and gas flaring chimneys. - Regular monitoring of surface concentrations of CH₄ will ensure that below 2m height above landfill work surface, the concentration of methane should not exceed 0.1%. 	O&M Unit	IA, PMO	-	-	Included in design and operating costs
5 Occupational and Community health	Odors and pests (landfill)	Diseases and pests	<ul style="list-style-type: none"> - To reduce the breeding of flies, mosquitoes, rats and other vermin, and to prevent odor and wind-borne dispersal of garbage, - Compaction and earth covering of the active tip face or landfill cell will be undertaken daily. - Periodic spraying with approved pesticide will further control the breeding of flies and mosquitoes and - Regular rat trapping programs will be undertaken. 	Landfill O&M Unit	IA, PMO	-	-	Included in operating costs
						Total Cost: 2,285,000		

ADB = Asian Development Bank; DI = Design Institute(s); LIEC = Loan Implementation Environmental Consultant; PMO = Project Management Office; EA = Executive Agency; IA = Implementing Agency; EMP = Environmental Management Plan; EPB = Environment Protection Bureau; IA=Project Implementation Unit; WSDND = Water Supply and Distribution Management Department.

E. Project Readiness Assessment

14. Before construction, the LIEC and PMO-EO will assess each IA's readiness in terms of environmental management based on a set of indicators (Table A1.4) and report it to ADB and the PMO. This assessment will demonstrate that environmental commitments are being carried out and environmental management systems are in place before construction starts, or suggest corrective actions to ensure that all requirements are met. The assessment will be repeated at regular intervals to account for new works contracts, and documented in the annual environment monitoring reports to ADB.

Table A1.4: Project Readiness Assessment Indicators

Indicator	Criteria	Assessment	
Environmental Supervision in place	LIEC is in place.	Yes	No
	Qualified EMSs contracted by the IAs	Yes	No
	Environment specialists assigned by PMO (PMO-EO) and IAs (IA-ES)	Yes	No
	External Monitor contracted	Yes	No
Compliance with loan covenants and assurances	The borrower complies with loan covenants related to project design and environmental management planning	Yes	No
Public involvement effectiveness	Meaningful consultation completed, construction activities publicized at construction sites	Yes	No
	GRM established with entry points publicized	Yes	No
Chinese version EMP distributed to all parties	EMP translated and distributed to PMO and all IAs	Yes	No
Preliminary works under retroactive funding	Audit undertaken of preliminary works (including Qitai transmission pipes, the road constructions and the greenbelts that are included in the retroactive financing) to ensure compliance with impact mitigation measures.	Yes	No
Contracts with environmental safeguards	Bidding documents and contracts incorporating the environmental activities and safeguards listed as loan assurances	Yes	No
Site construction planning (environmental)	Site Management Plan prepared for each work site by the contractors and cleared by the IAs	Yes	No
EMP financial support	EMP budget established, and required funds set aside for EMP implementation by each IA	Yes	No

EMS = Environment Monitoring Station, IA = Implementing Agency, LIEC = Loan Implementation Environment Consultant, PMO = Project Management Office.

F. Monitoring Requirements

15. Three types of project monitoring will be conducted under the EMP:

- (i) Internal monitoring to be conducted by the contractors and the Construction Supervision Companies (CSCs) in the construction phase and facility operators in the operations phase;
- (ii) External monitoring, to be conducted by an authorized company (environmental monitoring station (EMS)), contracted by the IAs;
- (iii) EMP compliance monitoring (whether EMP measures are being implemented), to be conducted by the LIEC on behalf of the PMO.

The internal monitoring and results of monitoring by the EMS will be reviewed and evaluated by an External Monitor contracted by the PMO.

16. The environmental monitoring plan at Table A1.5 covers the first two: internal and external monitoring.

17. **Internal monitoring** includes the monitoring of dust and noise at all construction sites as well as the quality of discharged construction wastewater, and erosion control. It also includes daily inspection and internal compliance assessment with the approved Site Management Plans of contractors, including construction site health and safety. During operations, each of the facility operation and maintenance units will monitor the environmental performance of their facility using appropriate indicator parameters.

18. **External monitoring by EMS** during construction measures the effects of noise, dust and wastewater runoff from construction sites over the project's area of influence – i.e. outside the construction site boundary. For dust and noise, this extends from the construction site boundary to any nearby sensitive receptors. For site runoff water it extends to the nearest receiving waterbody (drain, pond, canal or river). During operation it will focus on potential impacts from the landfill site on the air and groundwater of the surrounding area and the delivery of drinking water from the Qitai No.3 WTP along project pipes.

19. Table A1.5 shows the environmental monitoring program for internal monitoring and external monitoring designed for this project, defining the scope, location, parameter, duration and frequency, and responsible bodies, for monitoring during the construction and operational stages. Monitoring costs are estimates based on the experience of the PPTA team and PMO from other projects elsewhere in the PRC. ADB will oversee project compliance on the basis of the annual environmental monitoring reports provided by the PMO, compliance reviews by the LIEC and site visits as required.

20. The results of the environmental monitoring will be compared with EMP requirements, site management plans, and relevant PRC standards as defined in Table A1.6. Non-compliance will be highlighted in the monitoring reports. Additionally, an External Monitor will be contracted by the PMO to review and evaluate the results of the contractors' and operators' internal monitoring and the results of the EMS monitoring against PRC standards. The External Monitor will report to the ADB separately from the PMO's Environmental Monitoring Reports.

Table A1.5: Environmental Monitoring Program for Project Duration

Item	Parameter	Monitoring Location	Monitoring Frequency and Duration	Who Implements	Who Supervises	Cost CNYx10 ³
Pre-construction						
Ground-water quality	pH, COD, BOD, NH ₃ -N, TN, TP, E.coli, total turbidity, sulfate, chloride, Hg, Pb, Fl, Fe, Mn, Cu, Zn.	2 groundwater monitoring wells at 30m and 50 m north of leachate tank at Qitai landfill sites (both existing site and new site). The monitoring well shall be 30 m deep at least.	Once before detailed design is finalized for risk assessment of leakage and to establish baseline and inform remediation plan for existing landfill.	IA	PMO, EPB	50 (all Qitai)
Noise	L _{Aeq}	At identified sensitive receptor locations for road components: Hufang and Zhuang villages (Hubuti); Guangyuan Road school, and residences along Tianshi, Tianshan Roads (Fukang); Honglingjin Road hospital, and	Once before detailed design and site management plans are finalized, to establish noise baseline.	IA	PMO, EPB	10 (5 Fukang; 5 Hubuti)

Item	Parameter	Monitoring Location	Monitoring Frequency and Duration	Who Implements	Who Supervises	Cost CNYx10 ³
		residences along Guangming and Changqing Roads (Ganzezi).				
Construction Stage						
Internal monitoring						
Dust and noise	TSP, L _{Aeq}	At each construction site boundary (except new Qitai landfill due to its isolation)	One 24-hr continuous sampling period each week, during construction activity	CSC and contractor	IA, PMO	Included in construction cost (allow 70: 30 Fukang 20 Hubuti and 20 Qitai)
Surface water quality	SS, petroleum products	Construction wastewater released from construction sites	Once day per week during construction activity	CSC and contractor	IA, PMO	Included in construction cost (allow 100: 30 Fukang 20 Hubuti and 50 Qitai)
External monitoring						
Dust and noise	TSP, L _{Aeq}	At nearest sensitive receptor for each construction site; at construction site boundary (except new Qitai landfill due to its isolation)	1 day (24-hr continuous sampling) per month during construction activity	EMS	PMO	400 (70 Fukang 60 Hubuti 100 Qitai)
Surface water quality	SS, petroleum products	Selected points 200 m downstream of road construction and water supply pipe-laying.	2 times per week at each site during construction activity.	EMS	PMO	230 (70 Fukang 60 Hubuti 100 Qitai)
Operational Stage						
Internal monitoring						
Dust and Noise	Visual inspection for dust in household areas. L _{Aeq} measure for noise	At nearest sensitive receivers along project roads.	1 day per month for first 3 years of operation.	Roads O&M Unit	PMO, EPB	80 (30 Fukang 20 Hubuti and 30 Qitai)
Surface water quality	SS, petroleum products	Representative surface drainage points for each project road	Once every six months for first 3 years of operation.	Roads O&M Unit	PMO, EPB	80 (30 Fukang 20 Hubuti and 30 Qitai)
Odor	NH ₃ and H ₂ S for odor.	At nearest sensitive receivers from new landfill site	1 day per month for first 3 years of operation.	Landfill O&M Unit	PMO, EPB	30 (all Qitai)
Landfill gas	CH ₄ level (<0.1%)	At point 1 m above the ground on the working surface of the landfill and 100m downslope of landfill.	1 day per month for first 3 years of operation of new landfill.	Landfill O&M Unit	PMO, EPB	Included in O&M budget for landfill
Forest	Windbreak and	North Ring Road	Semi-annually for first 3	O&M Unit	PMO, EPB	Included in

Item	Parameter	Monitoring Location	Monitoring Frequency and Duration	Who Implements	Who Supervises	Cost CNYx10 ³
quality	shelterbelt plantings. % survival and replacement	Windbreak, S303 Road Shelterbelt and South Mountainous ecological forest.	years of operation.			O&M budget
Drinking water quality	pH, DO, COD, BOD ₅ , N-NH ₃ , TP, TN, Cu, Zn, F1, Se, Ar, Hg, Cd, Cr, Pb, SO ₃ , faecal coliforms, SO ₄ , Cl, Fe, Mn	At water outlet points at Qitai No.3 WTP	2 days per week. Ongoing monitoring.	WTP operators	PMO, EPB	Included in O&M budget
Ground-water	pH, COD, BOD, NH ₃ -N, TN, TP, E.coli	Permanent groundwater monitoring wells.(i) one sunk at 30m downstream of leachate holding tank at new Qitai landfill. (ii) one 50 m downstream from the existing Qitai landfill.	Monthly	Landfill operator	PMO, EPB	Included in O&M budget
External monitoring						
Noise, dust and odor	TSP, L _{Aeq} and NH ₃ and H ₂ S for odor.	At nearest sensitive receivers from new landfill site and existing landfill.	Quarterly until PCR stage	EMS	PMO, EPB	40 (all Qitai)
Ground water quality	pH, COD, BOD, NH ₃ -N, TN, TP, E.coli, total turbidity, sulfate, chloride, Hg, Pb, F1, Fe, Mn, Cu, Zn.	Permanent groundwater monitoring wells.(i) one sunk at 30m downstream of leachate holding tank at new Qitai landfill. (ii) one 50 m downstream from the existing Qitai landfill.	Monthly for 12 consecutive months. Monitoring can cease when 100% compliance is achieved 3 consecutive times at each site	EMS	PMO, EPB	120 (all Qitai)
Landfill gas	CH ₄ levels	At point nearest development (where there is human activity) downslope of existing, closed landfill.	Every 2 months for first 3 years after closure of existing landfill.	EMS	PMO, EPB	100 (all Qitai)
Closed landfill	Leachate collection and transfer to new landfill; landfill gas collection and safe venting; groundwater monitoring, and; site compression.	Existing landfill at Lama Huliang after closure and rehabilitation.	Yearly for 5 years after closure.	EMS	PMO, EPB	100 (all Qitai)
Drinking water quality	pH, DO, COD, BOD ₅ , N-NH ₃ , TP, TN, Cu, Zn, F1, Se, Ar, Hg, Cd, Cr, Pb, SO ₃ , faecal coliforms, SO ₄ , Cl, Fe, Mn	At water outlet point at Qitai No.3 WTP.	Quarterly until PCR stage	EMS	PMO, EPB	180 (all Qitai)

Item	Parameter	Monitoring Location	Monitoring Frequency and Duration	Who Implements	Who Supervises	Cost CNYx10 ³
Total estimated cost:						2,030
EMS = Environmental Monitoring Station; EPB = Environment protection Bureau; O&M = Operation and Maintenance; PMO = Project Management Office; IA = Implementing Agency, WTP = water treatment plant						

Table A1.6: Monitoring Indicators and Applicable PRC Standards and Operational Plans

Phase	Indicator	Standard
Preconstruction	Groundwater quality (Qitai landfill)	Environmental Quality Standard for Groundwater (GB/T14848-93)
	Groundwater resource (Fukang)	No standard. Determines water balance for irrigation.
Construction	Dust and noise at construction site boundary	Emission Standard of Environmental Noise for Boundary of Construction Site (GB 12523-2011)
	Dust and noise at sensitive receptors	Ambient Air Quality Standard (GB 3095-1996) Environmental Quality of Noise Standard (GB3096-2008)
	Surface water quality	Surface Water Ambient Quality Standard (GB3838 – 2002)
Operation	Odor	Classification of Temporary Odor Intensity
	Noise at landfill	Emission Standard for Industrial Enterprises Noise at Boundary (GB 12348-2008)
	Drinking Water	National Drinking Water Quality Standard (GB 5749-2006)
	Windbreaks and shelterbelts	Survival rate of planted vegetation >75%

21. **Compliance monitoring.** EMP compliance monitoring is the systematic evaluation of the overall progress of the implementation of EMP measures (Table A1.3). Evaluation of the compliance with the EMP will be undertaken regularly by the PMO-EO and the LIEC. The PMO-EO and the LIEC will report EMP implementation progress and compliance along with information on project implementation, environmental performance of the contractors, and environmental compliance through quarterly project progress reports and annual environmental monitoring reports (Table A1.7).

G. Environmental Safeguards Reporting Requirements

22. Environmental monitoring and inspection activities and findings shall be documented for purposes of reporting, recording, verifying, referring on and evaluating the environmental performance of the Project. The documentation shall also be used as basis in correcting and enhancing further environmental mitigation and monitoring. The environmental reporting plan for the project is at Table A1.7 and the environment safeguards reporting requirements are defined below.

- (i) **Monthly internal progress reports by the Contractors** during construction, submitted to the IAs. These monthly reports will include; (i) physical construction progress; (ii) mitigation measures implemented; (iii) grievances received, resolved, closed and/or directed to other mechanisms; (iv) emergencies responded to; (v) internal monitoring conducted by the contractors and CSCs, and (vi) corrective actions taken.
- (ii) **Quarterly progress reports by IAs.** The quarterly reports by the IAs to the PMO will include a separate section on EMP implementation progress and environmental performance, including monitoring reports by local EMS on the results of external environmental monitoring as specified in the EMP, and any GRM activity.
- (iii) **Environment monitoring reports (EMRs) by the PMO** to be submitted to the EA and ADB annually to comply with environmental agreement in the loan and

PRC Law on EIA. The EMRs will not only report on the progress and results of environmental monitoring and compliance of EMP implementation but will also briefly: (i) assess the effectiveness of measures; (ii) point out violation/s, if any; (iii) assess/recommend corrective actions; and (iv) cite any coordination made for corrective actions and, if applicable, certifications for having instituted them effectively. The reports will also include the performance (complaints, responses) of the project GRM. Environmental monitoring reports will be reviewed and cleared by ADB and disclosed on the ADB website. The LIEC will support the PMO-EO in developing the annual environmental monitoring reports.

- (iv) **EMP Compliance report by the LIEC.** The LIEC will conduct an annual EMP compliance review and report the results to the ADB. This will comprise to findings from regular EMP compliance monitoring and site visits. It will identify any environment-related implementation issues, propose necessary corrective actions, and reflect these in a corrective action plan.
- (v) **External Monitor Reports.** The review and evaluation of the findings of the internal monitoring by contractors and CSCs, facility operators, and EMS will be reported annually to the ADB in a separate External Monitor report.
- (vi) **Environmental acceptance reporting.** Following the PRC Regulation on Project Completion Environmental Audit (MEP, 2001), within three months after the completion of each project component, an environmental acceptance report for each shall be prepared by a licensed environmental monitoring institute, contracted by the IA. The report will be reviewed and approved by the relevant EPB and the approval reported to ADB.

Table A1.7: Reporting Plan

Reports	From	To	Frequency
Pre-construction Phase			
Project Readiness	LIEC, PMO	ADB	1st EMR
Construction Phase			
Construction Implementation	Contractor, CSC	IAs	Monthly
Project progress reports	IAs	PMO	Quarterly
Environment progress and monitoring reports (EMR)	PMO	ADB	Annually
External Monitor Report	External Monitor	ADB	Annually
Environmental acceptance	Licensed acceptance institute	EPB	Once; within 3 months of completion of physical works
Operational Phase			
Environment progress and monitoring reports (EMR)	PMO	ADB	Annually
External Monitor Report	External Monitor	ADB	Annually until PCR
EMP implementation completion	PMO, LIEC	ADB	At PCR stage
ADB = Asian Development Bank; EPB = Environment Protection Bureau; EMS = Environmental Monitoring Station; LIEC = Loan Implementation Environment consultant; PMO = Project Management Office			

H. Institutional strengthening and training

23. The capacity of the IAs and the PMO's staff responsible for EMP implementation and supervision will be strengthened. All parties involved in implementing and supervising the EMP must have an understanding of the goals, methods, and practices of project environmental management. The project will address any lack of capacities and expertise in environmental management through (i) institutional strengthening, and (ii) training. Both will be funded as part of the project's capacity building output.

24. **Institutional strengthening.** The capacities of the PMO and IAs to coordinate

environmental management will be strengthened through the following measures:

- The appointment of a staff member within the PMO (PMO-EO) in charge of EMP coordination, including GRM;
- The appointment of one national environmental consultant under the loan implementation consultancy (the LIEC) to guide PMO and IAs in implementing the EMP and ensure compliance with ADB's Safeguard Policy Statement (SPS 2009); and
- The assignment of an environment specialist by each IA (IA-ES) to conduct regular site inspections and coordinate periodic air and noise monitoring.

25. **Training.** The EA, PMO and IAs will receive training in EMP implementation, supervision, and reporting, and on the Grievance Redress Mechanism. Initially the training will be in formal workshops, then will continue with on the job training by the LIEC and other specialists hired under the consulting services. The formal training will cover EMP implementation, supervision, and reporting, and the Grievance Redress Mechanism (Table A1.8). Training will be facilitated by the LIEC with the support of other experts under the loan implementation consultant services, and funded as part of Project Output 6: Capacity Building.

Table A1.8: Training Program

Training	Attendees	Contents	Times	Total Days	No. trainees	Cost (CNY / person / day)	Total CNY
EMP implementation	PMO, IAs, contractors	EMP measures, roles and responsibilities, monitoring, supervision, reporting procedures. Site management plans, including worker and community health and safety, and emergency planning.	Once prior to, and once after, the first year of project implementation	4	30	600	72,000
Grievance Redress Mechanism	PMO, IAs, contractors	Roles and responsibilities, Procedures	Once prior to, and once after, the first year of project implementation	2	20	600	24,000
Environmental protection and monitoring	PMO, IAs, EPB	Pollution control on construction sites (air, noise, waste water, solid waste)	Once (during project implementation)	2	30	600	36,000
Landfill operation safeguards	Landfill O&M supervisors	Daily operation of site, environmental safeguards and security. Operation of leachate treatment plant. Use and management of landfill gas. Use of pesticides. Daily operation of transfer station	Once (before commissioning)	3	10	600	18,000
Landfill closure safeguards	Qitai IA/ Landfill O&M supervisors	Best practice in closure and rehabilitation of a landfill	Once before closure operations	1	10	600	6,000
Training in forest management	Staff of O & M agency for shelterbelt and	Training in forest management including fertilizing and insect and pest control. Safe pesticide use as part of	Prior to Project implementation	2	5	600	6,000

Training	Attendees	Contents	Times	Total Days	No. trainees	Cost (CNY / person / day)	Total CNY
	landscaping.	integrated pest management.					
Total estimated cost:							162,000

I. Grievance Redress Mechanism, Consultation

26. A Grievance Redress Mechanism (GRM) will be established, at least 2 months before project implementation commences, as part of the project EMP to receive and manage any public environmental issues which may arise due to the Project. The PMO will ensure that potentially affected communities are informed about the GRM at an early stage of the project. During the project preparation phase, the IAs and PMO personnel received training on the GRM from the PPTA team.

27. The PMO is the lead agency responsible for overall management, implementation, and reporting of the GRM. The PMO-EO coordinates the GRM and: (i) instructs the IAs and contractors on their responsibilities in the GRM; (ii) establishes a simple Complaints Register, to document and track grievances received (including forms to record complaints and how they have been resolved); and (iii) reports on progress of the GRM in the annual environmental monitoring and progress reports (EMR) to ADB.

28. Each IA will assign a member of staff, who is responsible for implementation of the GRM and other relevant aspects of the EMP. This will be the IA-ES. Tasks include keeping a record of complaints. At least two months before construction commences, these contacts will be publicized at each construction site and forwarded to local village committees to ensure that entry points to the GRM are well known.

29. Costs for setting up the GRM procedures and publicizing them at subproject sites will be borne by the IAs. The costs of the centralized coordinating and record-keeping will be borne by the PMO. Indicative costs are in Table A1.3 under GRM.

30. **GRM readiness procedures prior to start of construction.** To be successful and reduce the likelihood of public concerns, the following measures will be implemented before any construction:

- 1) On-site procedures: (i) all contractors and CSC staff will be briefed by the PMO-EO and IA-ES on the GRM. Contractors and workers will be instructed to be courteous to local residents and, in the event they are approached by the general public with an issue, to immediately halt their work and report the issue to the foreman; (ii) at least one sign will be erected at each construction site providing the public with updated project information (the purpose of the project activity, the duration of disturbance, the responsible entities on-site), the GRM process, and contact names and details for the GRM entry points.
- 2) Non-project agencies: Prior to project construction, the PMO-EO will notify all relevant agencies about the project and GRM, so that if these agencies receive complaints, they know to contact the PMO-EO and follow up as necessary. This will include, but not be limited to, the EPB, and local police.

31. The procedure and timeframe for the GRM is shown in Figure A1.1 and is as follows.

Stage 1 (maximum 10 working days): Affected persons can submit a written or oral complaint to the contractor, CSC or IA. Complaints received by any other institutions will be referred back to the IA for action. The IA will notify the PMO-EO of the

complaint within two days. The PMO-EO will enter the complaint in the Complaints Register.

Where the complaint has been lodged via the EPB Hotline, the EPB will advise the IA and contractor and monitor the corrective actions.

The contractor, in consultation with the IA, attempts to resolve the issue directly with the affected person. Within five working days of receiving the complaint, the agency will provide clear advice to the affected person on the proposed corrective action and by when it will be taken. The corrective action will be implemented not later than 10 working days from receipt of the complaint. The PMO-EO will enter the resolution in the Complaints Register.

If quick corrective action is not possible, or the IA is unsure how to proceed, or the complainant is not satisfied by the initial corrective action, then the complaint will be referred to the PMO-EO for Stage 2.

Stage 2 (maximum 5 working days): For complaints not resolved in Stage 1, Stage 2 is initiated. The PMO-EO, contractor, CSC and IA will meet with the affected person and together discuss the issue and identify possible solutions. At the meeting, a possible solution will be agreed upon. The contractor or IA, as appropriate, will implement the agreed solution and report the outcome to the PMO-EO.

Stage 3 (maximum 10 working days): If Stage 2 is unsuccessful (i.e. no solution can be identified or the affected person is not satisfied with the proposed solution) the PMO-EO will convene a multi-stakeholder meeting and involve the Project Coordinating Group to ensure that any needed inputs from other project agencies are coordinated. The workshop will identify a solution acceptable to all. The agreed solution will be implemented and a report on the outcome provided to the PMO and ADB.

No part of the project GRM affects the existing rights of affected persons to take their complaints to the courts. If Stage 3 is unsuccessful in addressing the issue, this course is still available to affected persons.

The above steps relate to the construction phase where most complaints will be directed in the first instance to the contractor, CSC or IA. During initial operations, complaints will be received by the operations and maintenance (O&M) units of the facilities.

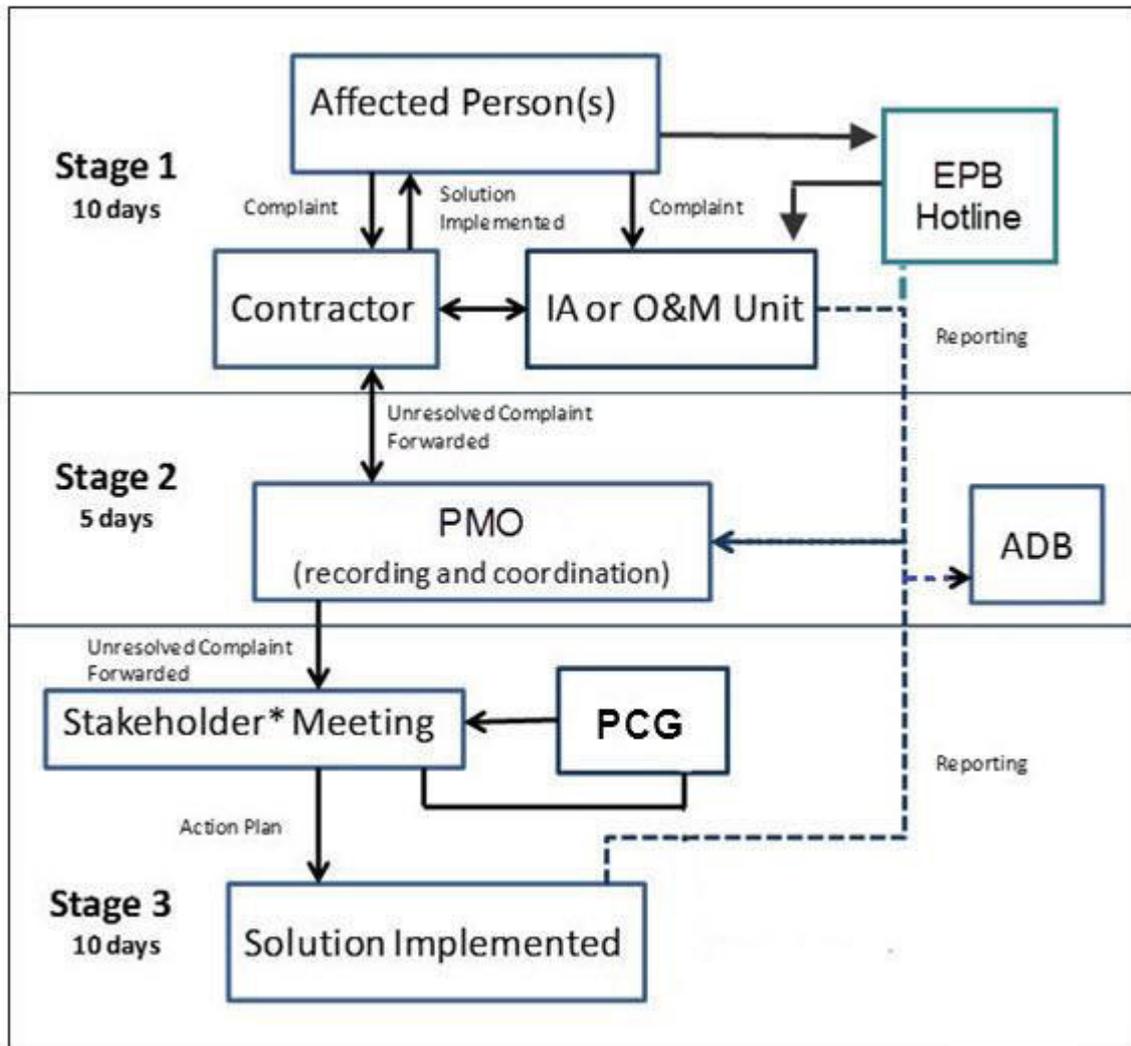
PMO will inform ADB of all complaints and actions under the GRM and include all relevant documents in its progress reports to ADB.

32. Any costs incurred to receive and document grievances will be paid by the PMO. The grievance procedures will remain valid throughout the duration of project construction and the first two years of project operation.

33. If the above steps are unsuccessful, people adversely affected by the project may submit complaints to ADB's Accountability Mechanism. All parties should employ their best efforts to solve problems that are reported through the GRM. Only when these are exhausted should the ADB's Accountability Mechanism be accessed.¹ The Accountability Mechanism provides an independent forum and process whereby people adversely affected by ADB-assisted projects can voice, and seek a resolution of their problems, as well as report alleged violations of ADB's operational policies and procedures.

¹See: www.adb.org/accountability-mechanism

Figure A1.1: The Project Grievance Redress Mechanism



* Stakeholders involved will depend upon the nature of the complaint and will include as a minimum the affected person(s), PMO, IA, and EPB. Other stakeholder agencies relevant to particular concerns can be called upon to contribute through the PLG.

Note: AP = affected person, EPB = environmental protection bureau, O&M = operation and maintenance, PMO = project management office; IA = Implementing Agency, PLG = Project Coordination Group.

J. Cost Estimates

34. This section provides an estimate of the cost of implementing the EMP. The costs are summarized in Table A1.9 below. The cost comprises three categories: mitigation and management measures (from Table A1.3); environmental monitoring (from Table A1.5); and, training (from Table A1.8). Refer to Tables A1.3, A1.5 and A1.8 for more details of each item. Costs are presented for the construction and operational phases of the project duration (until PCR stage). The costs do not include: (i) detailed design revisions and adjustments; (ii) facility operating costs (which include environmental safeguards); and (iii) the salaries of PMO environment staff. Costs for the mitigation measures are based on estimates in the domestic EIA and the experience of the PPTA team and PMO in other projects. Costs for the monitoring and training are also estimates based on the experience of the PPTA team in similar projects and discussed with the PMO.

35. The total estimated cost of implementing the EMP is CNY 3.9 million over the project duration (Table A1.9, overleaf). It is anticipated that about CNY 2.35 million (59.7%) will be paid through the construction contractors, CNY 1.4 million (35.8%) paid through the

IAs (mainly for external monitoring) and CNY 177,000 (4.5%) through the PMO.

36. During project implementation, the budget will be adjusted based on actual requirements. Contractors will bear the costs of all mitigation measures and internal monitoring during construction, which shall be budgeted in the bids. IAs will bear the costs related to setting up and running the GRM, mitigation measures during operation and external environmental monitoring during construction. Training costs will be part of the Project Implementation Support component of the project's capacity building output, through the PMO.

K. Mechanism for feedback and adjustment

37. Based on environmental monitoring and reporting systems in place, the PMO shall assess whether further mitigation measures are required as corrective action, or improvement in environmental management practices are required. The effectiveness of mitigation measures and monitoring and inspection plans will be evaluated by a feedback reporting system. If the PMO identifies a substantial deviation from the EMP, or if any changes are made to the project scope that may cause significant adverse environmental impacts or increase the number of affected people, then the PMO shall immediately consult ADB to identify EMP adjustment requirements.

Table A1.9. Estimated cost (CNY) of implementing the EMP over Five Years. See Tables A1.3, A1.5 and A1.8 for details of activities.

Item	Total cost 5 years	PMO	IA Fukang	IA Hubuti	IA Qitai	Contractors Fukang	Contractors Hubuti	Contractors Qitai
MITIGATION (EMP Table A1.3)								
PRE-CONSTRUCTION								
Water Safety Plan	60,000		60,000					
GRM	45,000	15,000	10,000	10,000	10,000			
CONSTRUCTION								
Domestic wastewater	120,000					40,000	20,000	60,000
Construction wastewater	470,000					150,000	120,000	200,000
Handling materials	220,000					70,000	50,000	100,000
Dust management	270,000					100,000	50,000	120,000
Vehicle emissions	100,000					35,000	25,000	40,000
Noise and vibration	250,000					120,000	70,000	60,000
Traffic management	300,000					200,000	50,000	50,000
Solid waste	90,000					30,000	20,000	40,000
Community safety	200,000					100,000	40,000	60,000
Site health and safety	160,000					50,000	40,000	70,000
Sub-total	2,285,000	15,000	70,000	10,000	10,000	895,000	485,000	800,000
MONITORING (EMP Table A1.5)								
PRE-CONSTRUCTION								
Groundwater testing at landfill	50,000				50,000			
Noise baseline at sensitive receptor locations	10,000		5,000	5,000				
CONSTRUCTION								
Internal monitoring								
Dust and noise	70,000					30,000	20,000	20,000
Water quality	100,000					30,000	20,000	50,000
External monitoring								
Dust and noise	400,000		200,000	100,000	100,000			
Surface water quality	230,000		70,000	60,000	100,000			
OPERATION								
Internal monitoring								
Noise (roads)	80,000		30,000	20,000	30,000			
Surface water quality (roads)	80,000		30,000	20,000	30,000			

Item	Total cost 5 years	PMO	IA Fukang	IA Hubuti	IA Qitai	Contractors Fukang	Contractors Hubuti	Contractors Qitai
Landfill gas (existing landfill)	30,000				30,000			
External monitoring								
Noise, dust and odor (landfill)	40,000				40,000			
Groundwater (landfill)	120,000				120,000			
Rehabilitation of existing landfill	100,000				100,000			
Drinking water quality (Qitai No.3 WTP)	180,000				180,000			
Sub-total	1,490,000	0	335,000	205,000	780,000	60,000	40,000	70,000
TRAINING (EMP Table A1.8)								
EMP implementation	72,000	72,000						
GRM	24,000	24,000						
Environmental monitoring	36,000	36,000						
WTP-safeguards	6,000	6,000						
Landfill - safeguards	18,000	18,000						
Wetland and forests env. management	6,000	6,000						
Sub-total	162,000	162,000	0	0		0	0	
GRAND TOTAL CNY	3,937,000	177,000	405,000	215,000	790,000	955,000	525,000	870,000
Total USD (USD1=CNY6.9)	570,580	25,652	58,696	31,160	114,492	138,406	76,087	126,087
Proportion of total (%)	100.00%	4.50%	11.68%	5.33%	18.80%	24.26%	13.34%	22.10%

GRM = Grievance Redress Mechanism; WTP = water treatment plant.

L. Public Consultation Plan

38. Two rounds of public consultation, including information dissemination, have been undertaken during the PPTA and are described in Chapter VII of the IEE. Plans for public involvement during the detailed design, construction and operation phases have also been developed during project preparation. These plans include public participation in (i) monitoring impacts and mitigation measures during the construction and operation stages, (ii) evaluating environmental and economic benefits and social impacts, and (iii) interviewing the public after the sub-components are completed.

39. Public participation plans are part of the project implementation and management plan. The IAs are responsible for public participation during project implementation and operation. Costs for public participation activities during construction are covered by project funding. The unit costs are estimated as CNY5,000 (\$770) for each public workshop, and CNY6,000 (\$920) for each press conference.

Table A1.10: Public Consultation Plan

Organizer	Format	Frequency	Subject	Attendees
Pre-Construction Stage				
PMO, IAs, PIUs, LIEC	Targeted public consultation & site visits	Before construction at each site	Agreement with affected persons and sensitive receivers on heavy machinery work. Consultation on safety of nearby communities.	Affected persons in impacts zone of construction activities
Construction Stage				
PMO, IAs, PIUs, LIEC	Public consultation & site visits	Once each year during construction	Adjusting of mitigation measures, if necessary; construction impact; comments and suggestions	Residents in project areas
PMO, LIEC	Public opinion	Once at MTR stage	Public satisfaction with EMP implementation	Residents in project areas
Operational Stage				
PMO, O&M Units, LIEC	Public consultation and site visits	Once in the first year	Effectiveness of mitigation measures, impacts of operation, comments and suggestions	Residents in project areas
LIEC, PMO	Public satisfaction survey	Once at PCR stage	Public satisfaction with EMP implementation. Comments and suggestions	Residents in project areas
EPB = Environmental Protection Bureau, PMO = Project management office, LIEC = Loan implementation environment consultant; MTR = midterm review; PCR = project completion review				

ANNEX A. DRAFT TERMS OF REFERENCE: PMO ENVIRONMENT OFFICER (PMO-EO)

I. BACKGROUND

1. Development projects which are assisted by the Asian Development Bank (ADB) routinely require the establishment of a Project Management Office (PMO). The PMO is responsible for project implementation. Compliance with the Loan and Project Agreements includes implementation of an Environment Management Plan (EMP), which is prepared as part of the project environment impact assessment. The EMP is the critical guiding document to manage, monitor, and report upon potential project environmental impacts. Implementation of the EMP is a full-time task. For this reason, the PMO assigns a full-time officer for this role. These terms of reference describe the requirements for this officer.

II. SCOPE AND DURATION OF WORK

2. The officer will work on behalf of the PMO to implement the project EMP. The officer will report directly to the PMO. The position is for the entire project duration (five years).

III. QUALIFICATIONS

3. The officer will have: (i) an undergraduate degree or higher in environmental management or related field; (ii) at least five years of experience in environmental management, monitoring, and/or impact assessment; (iii) ability to communicate and work effectively with local communities, contractors, and government agencies; and (iv) ability to analyze data and prepare technical reports. Desirable, but not essential, is a proficiency in spoken and written English.

IV. DETAILED TASKS

4. The PMO Environment Officer will have a detailed understanding of the project EMP and supporting documents, including the domestic environmental reports, the project EIA, and project environmental assurances. The officer will have the following tasks.

- (i) Assess whether the EMP requires updating due to any changes in project design which may have occurred after the EMP was prepared.
- (ii) Distribute the Chinese language version of the EMP to all relevant agencies, including the implementing agencies, provincial and municipal agencies for environment protection. This should occur at least three months before construction begins.
- (iii) Conduct meetings with agencies as necessary to ensure they understand their specific responsibilities described in the EMP.
- (iv) Ensure that relevant mitigation, monitoring and reporting measures in the EMP are included in the bidding documents, contracts and relevant construction plans.
- (v) Confirm that the Implementing Agencies (IAs) responsible, through their contractors, for the internal environment monitoring described in the EMP understand their tasks and will implement the monitoring in a timely fashion.
- (vi) At least two months before construction begins, establish and implement the project Grievance Redress Mechanism (GRM) described in the EMP. This will include: (a) prepare a simple table and budget identifying the type, number and cost of materials needed to inform local communities about the GRM and starting dates and scope of construction; (b) design, prepare and distribute these materials, and plan and conduct

the community meetings; (c) prepare a form to record any public complaints; (d) prepare a summary table to record all complaints, including dates, issues, and how they were resolved; and (e) ensure that all relevant agencies, including contractors, understand their role in the GRM.

- (vii) Prior to construction, ensure that IAs and their contractors have informed their personnel, including all construction workers, of the EMP requirements. This will include all mitigation measures relating to impacts to air, water, noise, soil, sensitive sites, ecological values, cultural values, worker and community health and safety, respectful behavior when communicating with local communities, and responding to and reporting any complaints.
- (viii) During project construction, make regular site visits with LIEC to assess progress, meet with contractors and/or local communities, and assess compliance with the EMP.
- (ix) Ensure that all relevant agencies submit required progress reports and information, including environmental monitoring and reports of any issues or grievances.
- (x) Compile, review, and store environmental progress reports from the IAs, records of any grievances, and any other relevant issues. Maintain digital copies of all information. When necessary, enter data into summary tables in digital format (e.g. to transfer records of grievances from hard copy forms). Ensure that all information is stored in the PMO filing system, backed up, and can be easily retrieved.
- (xi) Prepare environment progress reports for ADB.
- (xii) Work closely with the PMO, IAs, loan implementation consultants, and other agencies and personnel as necessary to conduct these tasks.

V. REPORTING REQUIREMENTS

Annual environment monitoring reports, using the template provided by ADB or a domestic format reviewed and approved by ADB.

VI. LOGISTICAL SUPPORT PROVIDED BY PMO TO THE ENVIRONMENT OFFICER

- (i) Provision of hard and soft copies of the project EMP, domestic and project environmental reports, feasibility study reports, loan and project agreements, maps, and other supporting materials as necessary to ensure the officer can implement the tasks.
- (ii) Vehicle transport, office materials, and other logistical support as necessary for the officer to visit the project construction sites and local communities, arrange and conduct meetings, and prepare and distribute consultation materials.
- (iii) Overall coordination, including review of the draft annual monitoring reports and final responsibility for submission of the monitoring reports to ADB.

ANNEX B. DRAFT TERMS OF REFERENCE: LOAN IMPLEMENTATION ENVIRONMENTAL CONSULTANT (LIEC)

I. BACKGROUND

1. Implementation of the Project will be overseen and coordinated by a Project Management Office (PMO). The PMO will be assisted by a Loan Implementation Consultant team. The Loan Implementation Environmental Consultants (LIEC) will be a part of this team and will assist the PMO with implementation of the project Environmental Management Plan (EMP).

II. SCOPE AND DURATION OF WORK

2. This position could be a firm or individuals (one national, 10 person-months) engaged by the PMO. It is not part of the PMO in-house environmental specialist or the implementing agencies. The specialists will report directly to the PMO. The positions are for the entire project duration (5 years). The LIEC should be recruited as soon as possible after loan effectiveness, as the first task is to confirm project environmental readiness (EMP Table A1.4).

III. QUALIFICATIONS

3. The specialists will have: (i) a Masters degree or higher in environmental management or related field; (ii) at least five years of experience in environmental management, monitoring, and/or impact assessment; (iii) familiarity with ADB project management requirements and national environmental management procedures; (iv) ability to communicate and work effectively with local communities, contractors, and government agencies; (v) ability to analyze data and prepare technical reports; and (vi) proficiency in spoken and written English.

IV. TASKS

Before construction

- (i) Ensure project environmental readiness, including: (a) checklist in Table A1.4 of the EMP is achieved; (b) all contractor contracts include, and will comply with, the EMP; and (c) relevant sections of the EMP are incorporated in construction plans and contracts.
- (ii) Assist the PMO to implement the GRM, including: (a) establish and publicize the GRM; and (b) collate and evaluate grievances received.
- (iii) Develop procedures to: (a) monitor EMP implementation progress; (b) collate and evaluate data collected in the EMP environmental monitoring program; and (c) prepare and submit the annual environmental monitoring reports to ADB (to continue until Project Completion Report).
- (iv) Undertake training of project agencies as required by the EMP training plan.
- (v) Provide hands-on support and on-the-job training to the PMO, IAs and contractors on the specific requirements of the EMP as required.

During project implementation

- (i) Undertake site visits to all IAs and project sites during subproject construction and operating phase.
- (ii) Assist in the ongoing public consultation process as described in the EMP Table A1.10.
- (iii) Conduct EMP compliance assessments, identify any environment-related implementation issues, and propose necessary responses in corrective action plans.
- (iv) Report to ADB yearly on results of EMP compliance reviews.
- (v) Assist in training of project agencies as required by the EMP training plan (EMP Table A1.8).
- (vi) Assist PMO to prepare annual environmental monitoring progress reports for submission to ADB.

ANNEX C: TERMS OF REFERENCE FOR IA ENVIRONMENTAL SUPERVISOR (IA-ES)

I. BACKGROUND

Development projects which are assisted by the Asian Development Bank (ADB) require compliance with the Loan and Project Agreements. This includes implementation of an Environment Management Plan (EMP), which is prepared as part of the project environment impact assessment. The EMP is the critical guiding document to manage, monitor, and report upon potential project environmental impacts. Implementation of the EMP by each IA and their contractors requires the full time assignment of an Environmental Supervisor within the construction management team of each IA. These terms of reference describe the requirements for this officer.

II. SCOPE AND DURATION OF WORK

The IA-ES will work with the PMO Environment Officer, contractors and other relevant personal, to implement the EMP. The IA-ES will report to IA construction manager. Duration will be for the project implementation period up to Project Completion Report stage.

III. QUALIFICATIONS

The IA-ES will have: (i) an undergraduate degree or higher in a relevant field; (ii) experience in environmental management, monitoring, and/or impact assessment; (iii) ability to communicate and work effectively with local communities, contractors, and government agencies; (iv) ability to analyze data and prepare technical reports; and (v) willingness and health to regularly visit the sub-project sites.

IV. DETAILED TASKS

Working closely with the PMO Environment Officer, and contractors, each IA-ES will:

1. Develop a high level of familiarity with the EMP;
2. Assist the contractors to prepare Site Management Plans for each major work location, which incorporates all relevant EMP provisions;
3. Assist the PMO-EO in setting up and publicizing the GRM at the local level;
4. Coordinate the receipt of complaints and corrective responses at the local level for the GRM.
5. Undertake, coordinate and supervise internal monitoring as per EMP Table A1.5.
6. Receive and evaluate monthly reports of work performance from contractors
7. Prepare environmental monitoring reports for quarterly submission to the PMO.
8. Attend training as required.

V. REPORTING REQUIREMENTS

Quarterly environmental reports to the PMO, using the template provided by ADB or a domestic format reviewed and approved by ADB.

ANNEX D: TERMS OF REFERENCE FOR EXTERNAL MONITOR

I. BACKGROUND

1. The government of the People's Republic of China (PRC) has requested the Asian Development Bank (ADB) to provide financial support for the proposed Xinjiang Changji Integrated Urban-Rural Infrastructure Demonstration Project (the project). The Project will support the priorities of the Changji Hui Autonomous Prefecture (CHAP) Government on integrated urban and rural development, as well as economically and socially inclusive urbanization. Outputs under the project will include: Improved urban services infrastructure (water transmission and distribution pipelines and a sanitary landfill and garbage transfer station for Qitai); constructed or rehabilitated urban-rural road infrastructure in Fukang, Hutubi, and Qitai; and establishment of windbreak and ecological forests in Fukang; construction of technical and vocational skills training facilities in Fukang; and development of project management capacity of government agencies and community groups.

2. Compliance with the Loan and Project Agreements includes implementation of an Environment Management Plan (EMP), which is prepared as part of the project environment impact assessment. Implementation of the Project will be overseen and coordinated by the Changji Project Management Office (PMO). The PMO will engage a licensed qualified external environmental monitoring entity. External monitoring support will provide assistance to the CHAP Government and PMO in monitoring and supporting project implementation in compliance with the environmental management plan (EMP) and ADB's safeguards policy.

II. SCOPE AND DURATION OF WORK

3. An external environment monitor will be engaged intermittently for the entire duration of project implementation. The consultant firm/institute with estimated total input of 6 person-months of national consultants will be engaged by consultants' qualifications selection (CQS) method.

III. TEAM COMPOSITION, QUALIFICATIONS AND TASKS

4. The External Environmental Monitor team will comprise (i) an Environment Management and Monitoring expert/team leader and (ii) an Environment Monitoring expert.

Environment Management and Monitoring expert/team leader (national expert: 2 person-months)

Qualifications:

5. Qualifications for the position include a masters degree or equivalent in environmental engineering with more than 10 years' relevant experience including 8 years' environmental impact assessment (EIA) and management experience, or professional experience in 4 international financial organization loan projects; familiarity with PRC and ADB requirements for environmental management is a plus; ability to prepare comprehensive environmental impact monitoring and assessment reports; relevant experience in similar ADB projects in the PRC is preferred.

Tasks:

- i. Team coordination and planning of external monitoring;

- ii. Conduct routine inspection on EMP implementation;
- iii. Provide advice to the IAs to optimize technical design of the project works from environmental aspect; assure the environmental mitigation measures are well undertaken in construction and operation;
- iv. Review project progress and compliance with the EMP based on field visits, and review the environmental impact monitoring conducted by contractors, CSCs and facility operators, and the Changji EMS. The findings will be reported in the format acceptable to ADB.

Environment Monitoring expert (national expert: 4 person-months in total)

Qualifications:

6. Masters degree or equivalent in environmental engineering with more than 8 years' relevant experience including 5 years' EIA and management experience, or professional experience in 2 international financial organization loan projects; familiarity with PRC and ADB requirements for environmental management is desirable; ability to prepare comprehensive environmental impact monitoring and assessment reports; relevant experience in similar ADB projects in China is preferred.

Tasks:

- i. Conduct routine inspection on EMP implementation;
- ii. Provide advice to the IA to optimize technical design of the project works from environmental aspect; assure the environmental mitigation measures are well undertaken in construction and operation;
- iii. Review project progress and compliance with the EMP based on field visits, and review the environmental monitoring conducted by contractors, CSCs and facility operators, and the Changji EMS. The findings will be reported in the format acceptable to ADB.
- iv. Assist the team leader in carrying out external monitoring activities.

IV. REPORTING REQUIREMENTS

7. During the service period, the consultant company shall prepare reports in accordance with ADB overall project management requirements. These will comprise annual External Environmental Monitoring Reports covering the construction phase and the operations phase until the Project Completion Report stage.