

Environmental Monitoring Report

Semi-annual Report
January 2015

PRC: Anhui Intermodal Sustainable Transport Project

Prepared by Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd. for the People's Republic of China and the Asian Development Bank.

This environmental monitoring report is a document of the borrower. The views expressed herein do not necessarily represent those of ADB's Board of Directors, Management, or staff, and may be preliminary in nature. In preparing any country program or strategy, financing any project, or by making any designation of or reference to a particular territory or geographic area in this document, the Asian Development Bank does not intend to make any judgments as to the legal or other status of any territory or area.

ADB Loan No. 3112-PRC: Anhui Intermodal Sustainable Transport Development Project

**SEMI-ANNUAL ENVIRONMENTAL MONITORING REPORT
(No. 1)**

Prepared by: Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd.

January, 2015

TABLE OF CONTENTS

1	INTRODUCTION	1
1.1	Description of the Project	1
1.2	Purpose of Report	4
1.3	Project Progress	4
2	IMPLEMENTATION OF THE EMP	5
2.1	Roles and Responsibilities for EMP and Monitoring Implementation	5
2.2	Environmental Mitigation Measures	8
2.3	Environmental Monitoring Data and Record	10
2.3.1	Surface Water Quality	11
2.3.2	Air Quality	11
2.3.3	Noise	12
2.3.4	Ecology	12
2.4	Environmental Institutional Capacity Building and Training	12
3	PUBLIC CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM	13
3.1	Public Consultation and Information Disclosure	13
3.2	Project Grievance Records and Resolution	14
4	COMPLIANCE WITH EMP REQUIREMENTS	15
4.1	Required Corrective Actions	15
5	APPENDICES	17
5.1	APPENDIX I: STATUS OF EMP COMPLIANCE	17
5.2	APPENDIX II: ADDITIONAL INFORMATION	29
5.2.1	Representative Photographs for Subproject IV: G206 Dongliu to Yaodu Section	29
5.2.2	Representative Photographs of Meetings, Seminars and Workshops	34

1 INTRODUCTION

1.1 Description of the Project

This project consists of four road subprojects (I-IV) and two waterway subprojects (V and VI) as shown in Table 1. Figure 1 shows the locations of the road subprojects and Figure 2 shows the locations of the waterway subprojects. \$200 million of the project cost is funded by ADB, with \$150 million applied to the road subprojects and the remaining \$50 million applied to the waterways subprojects.

Table 1: Composition of subprojects

Subproject No.	Subproject Title	Jurisdiction	Subproject Description
I	S367 Ma'anshan North Passage Road	Hanshan County, He County	46.874 km to class II
II	S319 Erba-Wuweï Section	Wuweï County	36.52 km to class I
III	Yimu Highway Kedian to Mujiating Section	Nanling County	22.36 km to class I
IV	G206 Dongliu to Yaodu Section	Dongzhi County	16.58 km to class I
V	Shuiyang River Waterway Improvement	Xuancheng City	Length 50 km, bottom width 40 m, water depth 2.5 m
VI	Xuanzhou Multipurpose Port	Xuancheng City	Four 1000 dwt berths totaling 295 m in length and 20 m in width, with a throughput of 1.5 million t/a

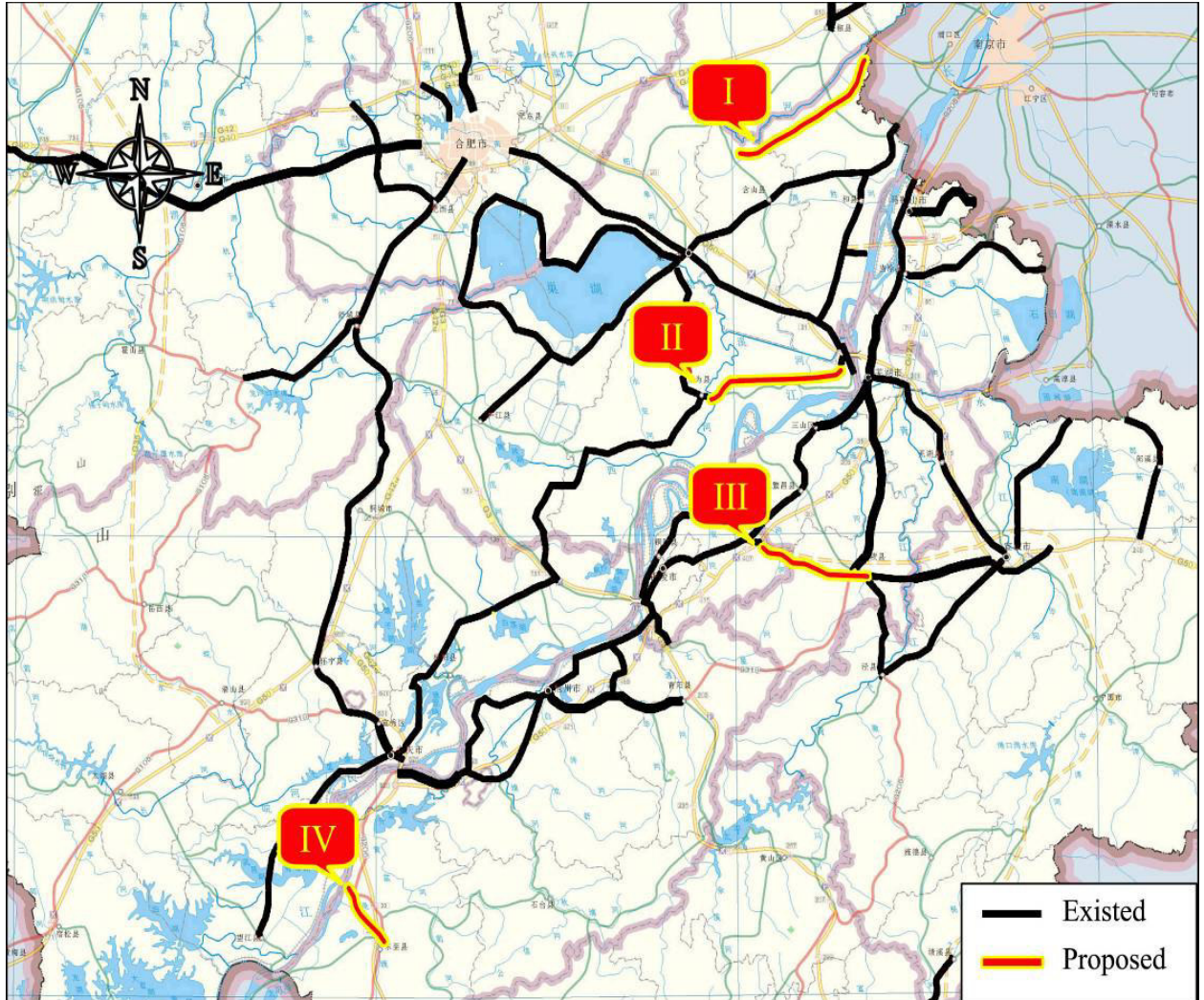


Figure 1: Location map of road subprojects

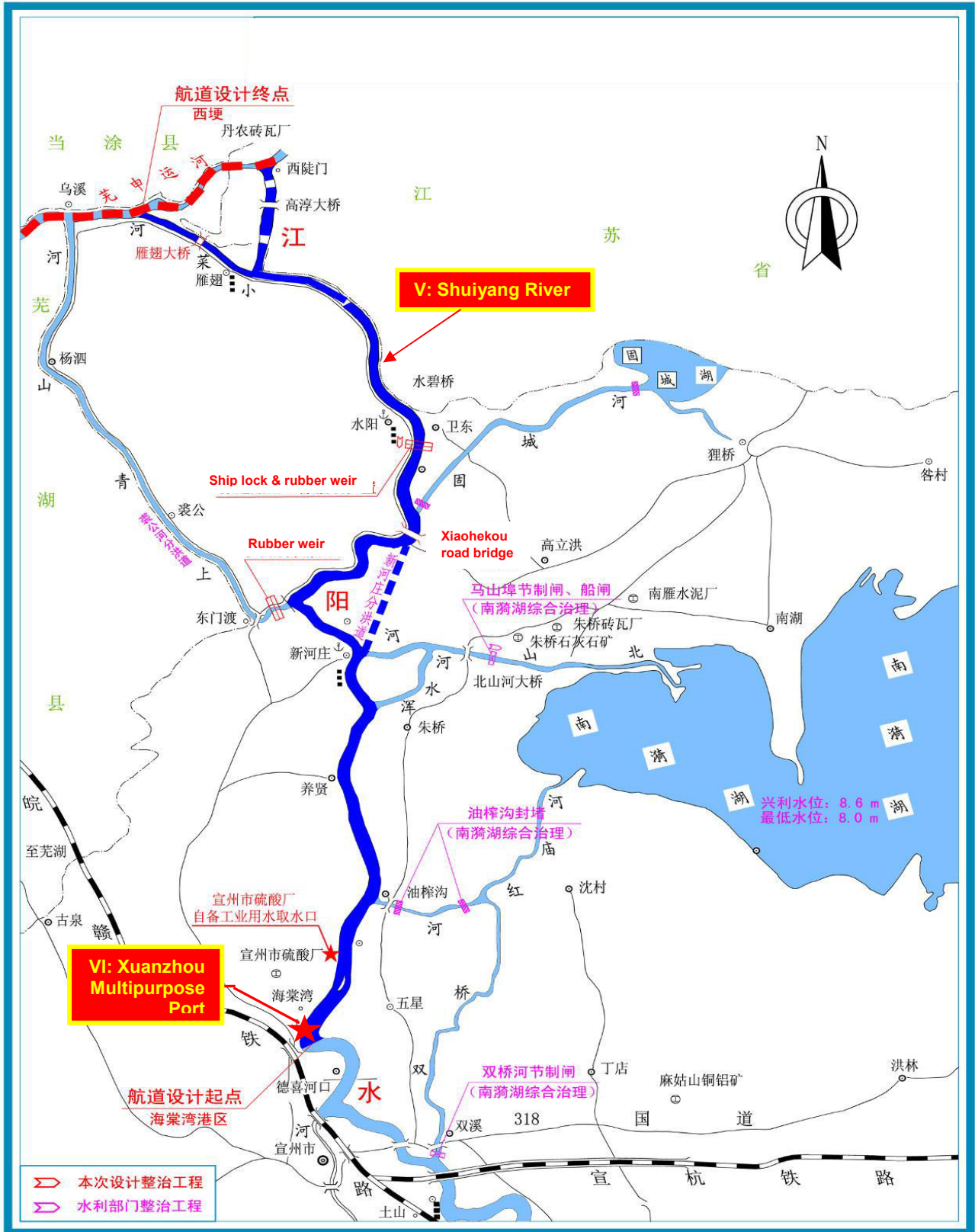


Figure 2: Location map of waterway subprojects

1.2 Purpose of Report

This is the first Environmental Monitoring Report (EMR) for the project, as required by ADB and its loan covenants to be submitted semi-annually. It covers the period from 24 September to 31 December 2014. The purpose of the report is to document the environmental protection and environmental supervision activities carried out during the reporting period for determining whether the Environmental Management Plan (EMP) and environmental protection measures recommended in the approved domestic Environmental Impact Reports were implemented effectively to avoid, minimize or mitigate adverse environmental impacts.

This report was prepared by the Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd. (BZHEPT), who is the external environmental supervision engineer (ESE) for the project. The report has been approved by the Foreign-funded Project Management Office (FFPMO) of the Anhui Province Department of Transport (Table 2).

Table 2: Preparation, review and approval of the Environmental Monitoring Report

Report title	ADB Loan No. 3112-PRC: Anhui Intermodal Sustainable Transport Development Project – Semi-annual Environmental Monitoring Report No. 1		
Prepared by	Wang Qiaochu, Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd	Submission date	3 August 2015
Reviewed by	Foreign-funded Project Management Office, Anhui Province Department of Transport	Review frequency	Every 6 months
Approved by	Foreign-funded Project Management Office, Anhui Province Department of Transport	Version	Draft

1.3 Project Progress

As of 31 December 2014, only subproject IV G206 Dongliu to Yaodu Section had commenced construction (Table 3). Other subprojects were in the tender preparation stage. Subproject IV has two contractors: (i) Anhui Highway and Bridge Engineering Co. Ltd. under contract NO2-1 covering chainage K0+000 to K9+900, and (ii) Anhui Road and Port Engineering Co. Ltd. under contract NO2-2 covering chainage K9+900 to K15+714. Anhui Zhongxing Engineering Supervision Co. Ltd. had been appointed to undertake construction supervision. The implementing agency, Chizhou City Highway Administration Bureau, had established a local project management office (LPMO), including a site office for construction supervision. Each contractor had established a site office/construction camp and an asphalt/concrete mixing station.

Table 3: Construction commencement dates of the subprojects

Subproject		Construction Commencement Date
I	S367 Ma'anshan North Passage Road	Not yet started
II	S319 Erba-Wuwei Section	Not yet started
III	Yimu Highway Kedian to Mujiating Section	Not yet started
IV	G206 Dongliu to Yaodu Section	24 September 2014
V	Shuiyang River Waterway Improvement	Not yet started
VI	Xuanzhou Multipurpose Port	Not yet started

Table 4 shows subproject IV progress in the reporting period. Considering the approval documents for the FSR, county planning and potential environmental impact on the Tiantaishan Forest Park, the end point for G206 was changed to near the Meicheng Farm (near existing G206 chainage K1292+820). The total road length is approximately 15.7 km. There was no other change on the overall alignment.

Table 4: Progress of subproject IV (up till 31 December 2014)

Subproject	Works Content	Implementation Status at the end of Reporting Period	Work Plan for Next 6 Months
------------	---------------	--	-----------------------------

Subproject	Works Content	Implementation Status at the end of Reporting Period	Work Plan for Next 6 Months	
IV	G206 Dongliu to Yaodu Section	<ul style="list-style-type: none"> (i) Access/haul road construction (ii) Clearing of existing road surface (iii) Subgrade construction (earth cut and fill) (iv) Desilting of rivers and ponds (v) Construction of cement piles (vi) Pipe and box culvert engineering (vii) Bore piling (viii) Subgrade side slope construction (ix) Construction of bridges and culverts 	<ul style="list-style-type: none"> (i) Contract NO2-1: Completed 16.74% of contract value as of 31 December 2014 consisting of: <ul style="list-style-type: none"> a) 211.25% completion on desilting of rivers and ponds (>100% due to actual quantity > computational quantity) b) 100% completion on clearing of existing road surface c) 90.9% completion on haul road construction d) 42.93% completion on cement piles e) 33.5% completion on earth excavation f) 28% completion on bored piles g) 14.48% completion on backfilling h) 11.12% completion on pipe culverts i) 9.1% completion on box culverts j) 4% completion on collar beams (ii) Contract NO2-2: Completed 19.14% of contract value as of 31 December 2014 consisting of: <ul style="list-style-type: none"> a) 136.78% completion on desilting of rivers and ponds (>100% due to actual quantity > computational quantity) and 133.33% completion on pipe culverts b) 82.8% completion on haul road construction c) 71.5% completion on clearing of existing road surface d) 50% completion on pipe culverts e) 46.09% completion on bored piles f) 38.68% completion on cement piles g) 22.88% completion on earth excavation h) 19.68% completion on back filling i) 14.29% completion on box culverts j) 1.37% completion on collar beams (iii) Recruitment of contractors for road pavement was in the stage of drafting of tender documents. The plan was to commission road pavement contractors and construction supervision entity through open tendering in the second half of 2015. 	Key activities will include subgrade earth works, construction of bridges and culverts, pre-casting of box girders. Specific works will include gravel laying, geogrids, side ditches, drainage ditches, slab stone retaining walls, haul roads, foundation piles, capping beams, T-beam pre-casting and installation, bridge surface paving and guard rail works.

2 IMPLEMENTATION OF THE EMP

2.1 Roles and Responsibilities for EMP and Monitoring Implementation

Environmental management during the construction of these subprojects followed the environmental management hierarchy shown in Figure 3. Table 5 shows the organization of implementing agencies, contractors and supervision organizations for subproject IV.

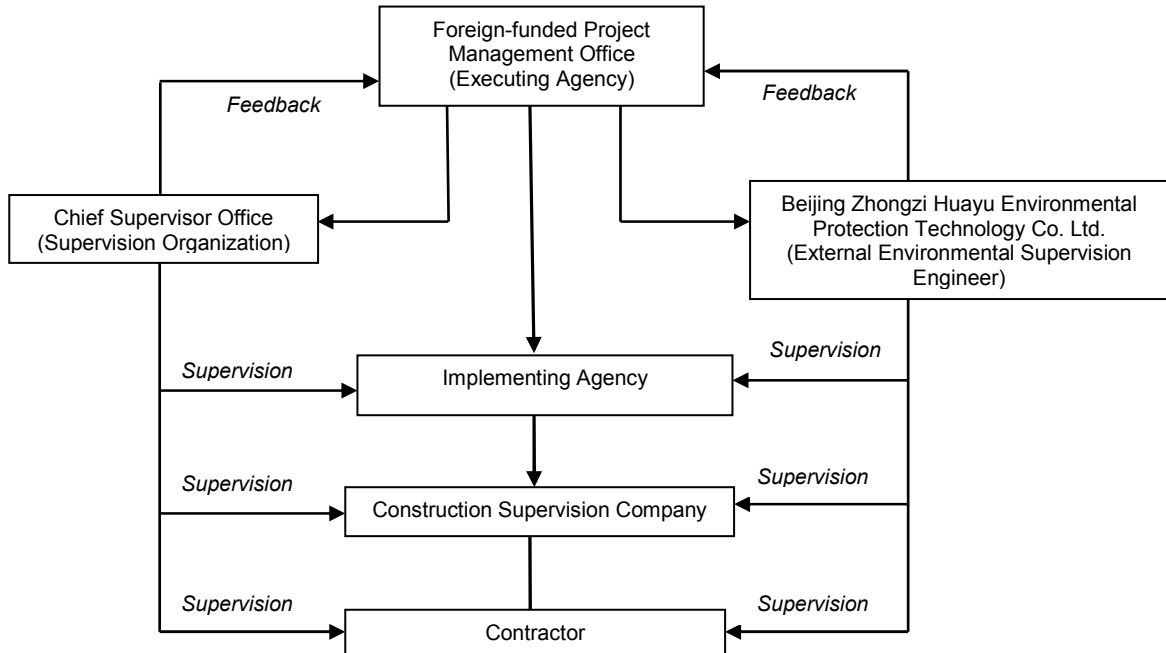


Figure 3: Environmental and construction management hierarchy

Table 5: Implementing agencies, contractors and supervision organizations for subproject IV

Subproject	Jurisdiction	Implementing Agency	Contractor		Supervision Organization	
			Contract #	Company	Construction	Environmental
IV G206 Dongliu to Yaodu Section	Dongzhi County	Chizhou City Highway Administration Bureau	NO2-1	Anhui Highway and Bridge Engineering Co. Ltd.	Anhui Zhongxing Engineering Supervision Co. Ltd.	Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd.
			NO2-2	Anhui Road and Port Engineering Co. Ltd.		

Executing Agency. The Anhui Province Department of Transport (APDOT) has assigned its Foreign-funded Project Management Office (FFPMO) to be the executing agency for the project. FFPMO is responsible for the overall project implementation and compliance with loan covenants and environmental management plan (including the environmental monitoring program). Specific duties include overall coordination and supervision, management of purchasing and financial matters, and institutional strengthening.

FFPMO has established an Environmental Protection Leading Group, with the FFPMO director as the group leader and other department heads as deputy group leaders and members. The duties of the Environmental Protection Leading Group include the following:

- Implement national and Anhui provincial environmental laws, regulations, policies and guidelines
- Organize and implement environmental protection training for the staff
- Confirm the environmental quality monitoring organization
- Regularly inspect the status of environmental protection during construction, and supervise the implementation of environmental protection measures by contractors
- Coordinate with local environmental protection and water resource bureaus to undertake supervision and management activities
- Coordinate with ADB and submit quarter progress reports and semi-annual environmental monitoring reports to ADB

Implementing Agency. The Chizhou City Highway Administration Bureau is the implementing agency for subproject IV as shown in Table 5 above. It has appointed one environmental staff to undertake the following activities:

- (a) Supervise contractors during construction to ensure compliance with the environmental management plan
- (b) Direct regular site inspections
- (c) Coordinate environmental quality monitoring so that it is consistent with the approved monitoring program
- (d) Act as the local entry point for the grievance redress mechanism
- (e) Submit contractors' quarterly inspection reports to the FFPMO and provincial and local environmental authorities for review and confirmation

Construction Supervision Engineer. The Anhui Zhongxing Engineering Supervision Co. Ltd. Is the construction supervision engineer for subproject IV as shown in Table 5 above, responsible for supervising the quality, progress, investment and safety of construction works. It had established a site office consisting of the following: project manager, chief engineer, engineering department, quality testing department, laboratory, materials department, and finance department etc.

External Environmental Supervision Engineer. The external environmental supervision engineer (ESE) is Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd. (BZHEPT), commissioned by FFPMO through open tendering. The ESE is responsible for environmental supervision of all the subprojects. The ESE had established an Environmental Supervision Project Department for this project, composed of a chief environmental consultant, environmental supervision engineers and supervisors with relevant professional and vocational qualifications and experiences. The chief environmental consultant is a Ministry of Environmental Protection (MEP) certified environmental impact assessment engineer and has overall responsibility for the environmental supervision of the whole project, with independent decisions on environmental supervision activities. Other site supervision staffs have education and experience in environmental protection or related fields, and have obtained vocational certification for undertaking environmental supervision on construction sites. They are responsible for conducting site inspections to ensure that the contractors carry out environmental protection measures in accordance with the EMP and recommendations in the approved domestic environmental impact reports.

The ESE reports directly to FFPMO and the environmental specialists in Anhui Environmental Protection Department. The ESE has the following duties:

- (a) Implement national and Anhui provincial environmental laws, regulations, policies and guidelines.
- (b) Support project preparation, including EMP revisions.
- (c) Support environmental capacity building and training.
- (d) Organize and supervise the implementation of environmental protection measures and related requirements in the EMP, the domestic environmental impact reports and the soil and water conservation reports.
- (e) Organize the daily management of environmental protection works, conduct regular (at least once per month for each subproject) and ad hoc (when environmental problems are found on site) site inspections on contractors' environmental protection performance and provide instructions when required, and supervise the implementation of various environmental protection measures.
- (f) Identify environmental related problems during subproject implementation and formulate necessary corrective actions and action plan.
- (g) Provide input to the quarterly progress report and the semi-annual environmental monitoring report.
- (h) Prepare documents and reports related to environmental supervision.

Contractor. The contractors for subproject IV are listed in Table 5 above. The contractors had established site offices consisting of various departments on engineering technology, planning and contracts, quality assurance, finance, materials and equipment, general office, and safety and environmental protection, etc. The contractors' environmental protection departments have the following duties:

- (a) Implement national and Anhui provincial environmental laws, regulations, policies and guidelines.
- (b) Assign dedicated environmental staff and environmental responsibilities in various sections within the construction sites, strengthen the management of environmental protection.
- (c) Establish a management system and filing system for environmental protection, and implement various environmental protection measures and related requirements in the EMP, the domestic

environmental impact reports and the soil and water conservation reports throughout the construction stage.

- (d) Cooperate with ESE supervision for implementing environmental protection measures during construction.
- (e) Report to ESE regularly on the implementation status of environmental protection measures.
- (f) Coordinate and cooperate with the Environmental Monitoring Stations during their environmental quality monitoring on the construction sites, and take responsibility for the environmental quality conditions within the impact areas of the construction sites.
- (g) Strictly comply with the construction management system, ensure that construction activities are confined within the red line areas.

Environmental Quality Monitoring. Table 6 shows the status of environmental quality monitoring arrangements for the subprojects. The Dongzhi County Environmental Monitoring Station (EMS) had been commissioned for conducting environmental quality monitoring subproject IV. The other subprojects had not commenced construction and the process of selecting relevant EMSs was ongoing.

Table 6: Arrangements for environmental quality monitoring of the subprojects

Subproject		Environmental Quality Monitoring Organization / Status
I	S367 Ma'anshan North Passage Road	Not yet appointed
II	S319 Erba-Wuwei Section	Not yet appointed
III	Yimu Highway Kedian to Mujiating Section	Not yet appointed
IV	G206 Dongliu to Yaodu Section	Dongzhi County Environmental Monitoring Station
V	Shuiyang River Waterway Improvement	Not yet appointed
VI	Xuanzhou Multipurpose Port	

Table 7 provides the names and contact information of individuals who are responsible for environment, health and safety of subproject IV. All parties involved in subproject IV were conscientious of workers' health and safety, and provision of regular health checkup for workers would be an important management objective. No accident had been recorded on construction sites to date.

Table 7: Project and subproject IV staffs responsible for environment, health and safety

Subproject	Name of Organization	Name of EHS Staff	Telephone (T) / Email (E)
Foreign-funded Project Management Office		WU Fei	Director T: 138 5695 1610
		HONG Congsheng	T: 159 0569 0995 T: (551) 6375 6191
External environmental supervision engineer		WANG Qiaochu	Chief Engineer T: 152 1095 4356 E: 175960016@qq.com
		TAO Jiaxun	Environmental Engineer E: 270703449@qq.com
		MA Qiqi	Environmental Engineer T: 177 1065 2761 E: 1206213026@qq.com
IV. G206 Dongliu to Yaodu Section	Implementing Agency: Chizhou City Highway Administration Bureau	WEN Fadong	T: 180 5667 3190 T: 139 5689 8908
	Construction supervision engineer site office: Anhui Zhongxing Engineering Supervision Co. Ltd.	LIU Zhiqiang	T: 186 5665 6676 E: 952648552@qq.com
	NO2-1 contractor: Anhui Highway and Bridge Engineering Co. Ltd.	ZHOU Jianfeng	T: 189 0569 5098
	NO2-2 contractor: Anhui Road and Port Engineering Co. Ltd.	SUN Pengzhi	T: 156 5668 7090

2.2 Environmental Mitigation Measures

Compliance with the EMP on implementation of mitigation measures is presented in Appendix I. Key mitigation measures for subproject IV are highlighted below. Representative photographs of construction sites and activities, and environmental mitigation measure are shown in Appendix II.

Air Quality. Each contract had at least one water truck for spraying water to suppress dust in unpaved areas and haul roads at least two times per day and more frequent during dry weather and windy days. Sheltered compartments were installed on construction sites for material storage. Each contract had

established one asphalt/concrete mixing station. The asphalt/concrete mixing station for Contract NO2-1 uses the existing Lishan Daoban facility next to G206. The asphalt/concrete mixing station for Contract NO2-2 is a new facility constructed for the subproject, which is located next to the Dongzhi County Wastewater Treatment Plant (WWTP) near G206 and far from local towns and villages. Both mixing stations were paved. The site offices and pre-casting yards were constructed next to these asphalt/concrete mixing stations.

Water Quality. Drainage ditches were constructed within the asphalt/concrete mixing stations to collect surface runoff. The asphalt/concrete mixing station for Contract NO2-1 has a 4-chamber sedimentation tank while that for Contract NO2-2 has a 3-chamber sedimentation tank. Supernatant water from the sedimentation tanks was re-used on site for pavement cleaning and dust suppression. Site offices are equipped with toilet facilities and septic tanks for wastewater treatment. The effluent from the septic tank in Contract NO2-2 is conveyed to the neighboring Dongzhi County WWTP for further treatment. The sedimentation tanks and septic tanks were maintained regularly.

Ditches were constructed around borrow areas and spoil disposal sites to facilitate site drainage. Berms were also constructed around the perimeters to prevent the outflow of muddy slurry. Exposed surfaces not yet ready for borrowing were covered with geotextiles to minimize soil erosion.

Noise. Low noise powered mechanical equipment were deployed subject to availability. The use of multiple noisy powered mechanical equipment simultaneously was prohibited. Night time (22:00 to 06:00 hr.) construction works was prohibited.

Solid Waste. Sufficient garbage bins were provided on construction sites and asphalt/concrete mixing stations for collection of refuse. Construction and demolition (C&D) waste and excavated spoil were stored at spoil disposal sites.

Ecology. Top soils from borrow areas and disposal sites were stripped, removed off site and stored for later use in site rehabilitation. Signs on protection of vegetation and wildlife, and prohibition of hunting were erected on construction sites and construction camps.

The ESE has raised the following requirements for protection of flora and vegetation:

- (i) At will use of land outside the construction site boundary is prohibited. Needed haul roads and construction staging areas should be confined within the permanent land take areas.
- (ii) Soil layers should be separately stacked during storage and restored by layers during backfilling. Top soils should be reused for vegetation rehabilitation in the area.
- (iii) Locations of borrow areas, spoil disposal sites, haul roads, asphalt/concrete mixing stations and construction camps should be away from trees and woodlands.
- (iv) All contractors should provide training on prevention of forest fire, and prevent any means that could cause forest fire.
- (v) Forestry authorities should immediately be notified and preventive measures immediately taken should old trees be found on site during construction.

Site inspections conducted during September to December 2014 did not reveal (i) up take of land outside construction site boundaries; (ii) presence of large wooded areas taken up by haul roads, asphalt/concrete mixing stations, and construction camps; and (iii) reporting of forest fire in the vicinity of construction activities.

The ESE has also raised the following requirements for protection of wildlife and birds:

- (i) The contractors should attempt to shorten the construction duration
- (ii) Noisy activities such as blasting and piling should avoid the breeding season in late spring and early summer, especially during dawn, dusk and night time when wildlife is most active in their feeding and breeding activities.
- (iii) Hunting and destruction of flora and fauna by construction workers are prohibited.

2.3 Environmental Monitoring Data and Record

Table 8 summarizes the environmental quality monitoring programs for subproject IV. Environmental quality monitoring for other subprojects had not started during the reporting period.

Table 8: Environmental quality monitoring programs for the subprojects

Monitoring Specifics		Subprojects					
		I. S367 Ma'anshan North Passage Road	II. S319 Erba-Wuwei Section	III. Yimu Highway Kedian to Mujiating Section	IV. G206 Dongliu to Yaodu Section	V. Shuiyang River Waterway Improvement	VI. Xuanzhou Multipurpose Port
Air quality	Parameter	Daily average TSP					
	Location	Not yet started	Not yet started	Not yet started	4 monitoring points: 1- near asphalt /cement mixing station 2 - on unpaved haul road near construction site 3 - Zhazui 4 -Yangjia	Not yet started	Not yet started
	Frequency	Preconstruction stage: at least 3 consecutive days Construction stage: at least 3 consecutive days every 3 months					
Noise	Parameter	L_{Aeq}					
	Location	Not yet started	Not yet started	Not yet started	4 monitoring points: 1 & 2- outside the boundary walls of asphalt/ cement mixing station 3 - Zhazui 4 -Yangjia	Not yet started	Not yet started
	Frequency	Preconstruction stage: continual monitoring for 2 consecutive days. Construction stage: at least 2 consecutive days every 3 months				1 day time and 1 night time monitoring every 3 months	
Water quality	Parameter	pH, SS_{100} , 1_{Mn} , total petroleum hydrocarbon, NH_4-N , COD					
	Location	Not yet started	Not yet started	Not yet started	6 monitoring points: 1 & 2 – 50 m upstream and 50 m downstream of Xiaohuangni Lake bridge 3 & 4 – 50 m upstream & 50 m downstream of Quanshui Lake #1 bridge 5 & 6 – 50 m upstream & 50 m downstream of Quanshui Lake #2 bridge	Not yet started	Not yet started
	Frequency	Preconstruction stage: at least 2 consecutive days Construction stage: at least 2 consecutive days every 3 months				At least 2 consecutive days every 3 months during dredging	At least 2 consecutive days every 3 months during construction
Ecology	Parameter	Not applicable			Bird species and abundance	Not applicable	
	Location	Not applicable			Along the lake between chainage K6+000 to K15+000	Not applicable	
	Frequency	Not applicable			2 consecutive days per month for 2 months per season in summer, winter and transitional (either spring or autumn) seasons respectively	Not applicable	
Monitoring entity		Not decided.	Not decided.	Not decided.	Dongzhi County Environmental	Not decided.	

Monitoring Specifics		Subprojects					
		I. S367 Ma'anshan North Passage Road	II. S319 Erba-Wuweï Section	III. Yimu Highway Kedian to Mujiating Section	IV. G206 Dongliu to Yaodu Section	V. Shuiyang River Waterway Improvement	VI. Xuanzhou Multipurpose Port
					Monitoring Station & ornithologist		
Supervision entity	Implementing agency	Ma'anshan City Highway Administration Bureau	Wuweï County Transport Bureau	Nanling County Transport Bureau	Chizhou City Highway Administration Bureau	Anhui Province Ports and Shipping Construction Investment Group Co. Ltd	
ESE		Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd.					

2.3.1 Surface Water Quality

For monitoring potential water quality impacts during bridge construction, ADB adopted a “real time baseline” approach with an upstream “control station” and one or more downstream “impact stations”, with the standard that the suspended solids (SS) levels at the impact stations should be ≤130% of the SS level at the control station. When the SS levels at the impact stations are >130% of the SS level at the control station, it is indicative of excessive SS dispersing downstream from the bridge construction site and construction methods shall be reviewed and mitigation measures shall be adopted to reduce SS levels at the impact stations to ≤130% of the SS level at the control station. Table 9 presents the surface water quality monitoring data collected in the reporting period for subproject IV. Water quality data show compliance with Category III surface water quality standards at the monitoring locations on the days of monitoring, including compliance with the ADB requirement on downstream SS levels.

Table 9: Surface water quality monitoring data for the reporting period

Subproject	Monitoring Date	Monitoring Location	Parameters Monitored					Remark
			pH	SS	TPH	NH ₄ -N	COD	
				mg/L	mg/L	mg/L	mg/L	
IV. G206 Dongliu to Yaodu Section	2014.11.03	Xiaohuangni Lake bridge 50 m upstream	7.81	47	0.03	0.518	5.4	Complied with cat. III std.
		Xiaohuangni Lake bridge 50 m downstream	7.98	48	0.03	0.504	5.7	Complied with cat. III std. SS complied with ADB std.
		Quanshui Lake #1 bridge 50 m upstream	7.89	57	0.03	0.401	5.1	Complied with cat. III std.
		Quanshui Lake #1 bridge 50 m downstream	7.94	60	0.02	0.425	4.9	Complied with cat. III std. SS complied with ADB std.
		Quanshui Lake #2 bridge 50 m upstream	7.72	56	0.03	0.454	4.3	Complied with cat. III std.
		Quanshui Lake #2 bridge 50 m downstream	7.68	53	0.03	0.496	4.9	Complied with cat. III std. SS complied with ADB std.
	2014.11.04	Xiaohuangni Lake bridge 50 m upstream	7.72	49	0.03	0.419	5.0	Complied with cat. III std.
		Xiaohuangni Lake bridge 50 m downstream	7.86	53	0.04	0.437	5.5	Complied with cat. III std. SS complied with ADB std.
		Quanshui Lake #1 bridge 50 m upstream	7.53	51	0.02	0.423	5.3	Complied with cat. III std.
		Quanshui Lake #1 bridge 50 m downstream	7.69	55	0.03	0.409	5.4	Complied with cat. III std. SS complied with ADB std.
		Quanshui Lake #2 bridge 50 m upstream	7.81	61	0.02	0.514	5.0	Complied with cat. III std.
		Quanshui Lake #2 bridge 50 m downstream	7.73	57	0.03	0.507	5.2	Complied with cat. III std. SS complied with ADB std.
GB 3828-2002 Environmental quality standards for surface water		Category II	6-9	---	0.05	0.5	15	
		Category III	6-9	---	0.05	1.0	20	
		Category IV	6-9	---	0.5	1.5	30	
ADB project specific standard			Downstream					
			≤130%					
			upstream					

2.3.2 Air Quality

Table 10 presents the ambient air quality monitoring data collected in the reporting period for subproject IV. Air quality monitoring of total suspended particulates (TSP) at the monitoring locations on the days of monitoring complied with GB 3095-1996 class II ambient air quality standard for TSP at the sensitive receptors, and with GB 16297-1996 fugitive dust emission standard for TSP at the asphalt mixing stations. However, TSP levels exceeded class II ambient air quality standard at Contract NO2-1 asphalt mixing station on 3 November 2014 and at Contract NO2-2 asphalt mixing station on 4 November 2014. Attempts would be needed to suppress fugitive dust emissions at these sites to lower TSP levels to within GB 3095-1996 class II ambient air quality standard.

Table 10: Air quality monitoring data for the reporting period

Subproject	Monitoring Date	Monitoring Location	Daily Average TSP (mg/m ³)		Remark	
IV. G206 Dongliu to Yaodu Section	2014.11.02	Zhazui	0.113		Complied with GB 3095-1996 class II std.	
		Yangjia	0.103		Complied with GB 3095-1996 class II std.	
		Unpaved haul road at Guanshancunzhuang Upper Group	0.114		Complied with GB 3095-1996 class II std.	
		Contract NO2-1 asphalt mixing station	0.413		Complied with GB 16297-1996 std. but > GB 3095-1996 class II std.	
		Contract NO2-2 asphalt mixing station	0.252		Complied with GB 3095-1996 class II std.	
		Zhazui	0.092		Complied with GB 3095-1996 class II std.	
	2014.11.03	Yangjia	0.096		Complied with GB 3095-1996 class II std.	
		Unpaved haul road at Guanshancunzhuang Upper Group	0.123		Complied with GB 3095-1996 class II std.	
		Contract NO2-1 asphalt mixing station	0.387		Complied with GB 16297-1996 std. but > GB 3095-1996 class II std.	
		Contract NO2-2 asphalt mixing station	0.176		Complied with GB 3095-1996 class II std.	
		Zhazui	0.096		Complied with GB 3095-1996 class II std.	
		Yangjia	0.106		Complied with GB 3095-1996 class II std.	
	2014.11.04	Unpaved haul road at Guanshancunzhuang Upper Group	0.156		Complied with GB 3095-1996 class II std.	
		Contract NO2-1 asphalt mixing station	0.247		Complied with GB 3095-1996 class II std.	
		Contract NO2-2 asphalt mixing station	0.336		Complied with GB 16297-1996 std. but > GB 3095-1996 class II std.	
		GB 3095-1996 Ambient air quality standards		Class II	0.3	
		GB 16297-1996 Air pollutant integrated emission standards (for fugitive dust emissions at asphalt mixing station)			1.0	

2.3.3 Noise

Table 11 presents the noise monitoring data collected in the reporting period for subproject IV. Noise levels at all the monitoring locations on the days of monitoring complied with the applicable standards.

Table 11: Noise monitoring data for the reporting period

Subproject	Monitoring Date	Monitoring Location	Noise Level [Leq(dB)A]		Remark
			Day Time	Night Time	
IV. G206 Dongliu to Yaodu Section	2014.11.03	Zhazui	43.9	41.7	Complied with GB 3096-2008 cat. 4a std.
		Yangjia	42.6	41.9	Complied with GB 3096-2008 cat. 2 std.
		Contract NO2-1 asphalt mixing station N boundary	65.6	51.6	Complied with GB 12523-2011 std.
		Contract NO2-1 asphalt mixing station S boundary	64.8	54.8	Complied with GB 12523-2011 std.
		Contract NO2-2 asphalt mixing station E boundary	62.1	52.7	Complied with GB 12523-2011 std.
		Contract NO2-2 asphalt mixing station S boundary	60.2	51.6	Complied with GB 12523-2011 std.
	2014.11.04	Zhazui	46.4	42.5	Complied with GB 3096-2008 cat. 4a std.
		Yangjia	45.1	41.2	Complied with GB 3096-2008 cat. 2 std.
		Contract NO2-1 asphalt mixing station N boundary	62.7	53.6	Complied with GB 12523-2011 std.
		Contract NO2-1 asphalt mixing station S boundary	63.1	54.1	Complied with GB 12523-2011 std.
		Contract NO2-2 asphalt mixing station E boundary	60.4	52.7	Complied with GB 12523-2011 std.
		Contract NO2-2 asphalt mixing station S boundary	61.2	50.1	Complied with GB 12523-2011 std.
GB 3096-2008 Environmental quality standard for noise		Category 4a	70	55	For within 35 m from road
		Category 2	60	50	For beyond 35 m from road
GB 12523-2011 Emission standard of environmental noise for boundary of construction site			70	55	

2.3.4 Ecology

No bird survey was undertaken in the reporting period.

2.4 Environmental Institutional Capacity Building and Training

Table 12 presents capacity building and training plan and its implementation status for subproject IV. Table 13 presents the seminars and workshops conducted in the reporting period for subproject IV. Photographs for selected seminars and workshops are presented in Appendix II.

Table 12: Environmental institutional capacity building and training plan and implementation status for subproject IV

Stage	Training Content	Attendee	Combined Duration	Time	Implementation Status
Construction	Environmental management and related policies	1 to 2 persons from each subproject implementing agency and design institute	30 days	2013-2015	Training conducted on 2014.09.23. See Table 13 for details
	1. Environmental Protection Law, regulations and related policies 2. Protection of cultural relics 3. Highway environmental impact assessment & environmental management plan 4. Environmental monitoring methods 5. Environmental supervision	2 persons from each contractor and construction supervision company; 4 persons from design institute	4 days	2013	Training conducted on 2014.09.25 and 2014.09.27. See Table 13 for details
	Environmental management emergency response plan and measures	2 persons from FFPMO, each subproject implementing agency, each contractor and each construction supervision company	3 days	2014-2015	Training conducted from 2014.11.04 to 2014.11.07.

Table 13: Environmental training seminars and workshops for subproject IV in the reporting period

Topic	Trainer	Attendee		Date
		Organization	No.	
Subproject organizational structure; division of duties and responsibilities; requirements for construction supervision; and training by ESE on supervision procedures, quality and safety.	LIU Zhiqiang, supervision engineer, Anhui Zhongxing Engineering Supervision Co. Ltd	Subproject management staff, contractors and supervision staff	20	2014.09.23
Training and discussion on environmental supervision scope, procedures and system	1. LIU Lingfeng, senior engineer, Shanghai Shipping Transport Science Research Institute 2. ZHANG Xiang, environmental supervision engineer, AHEPESTCL 3. TAO Jiaxun, environmental supervision engineer, AHEPESTCL	FFPMO, IA, contractors and supervision staffs	20	2014.09.25
Environmental management training, performing environmental supervision tasks, issues and problems of concern, compliance with related laws and regulations, and assignment of responsibilities for the organizations.	LIU Lingfeng, senior engineer, Shanghai Shipping Transport Science Research Institute	FFPMO, IA, contractors and supervision staffs	20	2014.09.27
ADB environmental safeguard policy requirements, environmental management plan, environmental responsibilities during construction, construction site environmental auditing, environmental monitoring, grievance redress mechanism, and compliance with the above requirements.	Alan Y. KWOK, ADB environmental specialist	FFPMO, IA, contractors and supervision staffs	25	2014.11.04
Site inspection on implementation of environmental protection measures, recommendations on corrective actions.	Alan Y. KWOK, ADB environmental specialist	FFPMO, IA, contractors and supervision staffs	25	2014.11.07
Notes: ADB = Asian Development Bank; AHEPESTCL = Anhui Huafan Environmental Protection Engineering Science and Technology Co. Ltd.; FFPMO = Foreign-funded Project Management Office; IA = implementing agency				

3 PUBLIC CONSULTATION, DISCLOSURE AND GRIEVANCE REDRESS MECHANISM

3.1 Public Consultation and Information Disclosure

Table 14 presents the public consultation plan and implementation status as of 31 December 2014. Project information and environmental impact assessment findings were disclosed on local city and/or county government web sites. Bill boards were also erected on construction sites and construction camps disclosing project information, environmental and safety measures, and complaint hotline numbers to the communities.

Table 14: Public consultation plan and implementation status

Organizer	Format	No. of Times	Subject	Attendees	Implementation Status
Construction stage					

Organizer	Format	No. of Times	Subject	Attendees	Implementation Status
FFPMO, IAs	Public consultation & site visit	4 times: 1 time before construction commences and 1 time each year during construction	Adjusting of mitigation measures, if necessary; construction impact; comments and suggestions	Residents adjacent to project sites, representatives of social sectors	Conducted once before subproject IV G206 Dongliu to Yaodu Section construction commencement
FFPMO, IAs	Expert workshop or press conference	As needed based on public consultation	Comments and suggestions on mitigation measures, public opinions	Experts of various sectors, media	Not yet started
Operational stage					
FFPMO, O&M units	Public consultation and site visits	Once in the first year	Effectiveness of mitigation measures, impacts of operation, comments and suggestions	Residents adjacent to project sites, representatives of residents and representatives of social sectors	Not yet started
FFPMO, O&M units	Expert workshop or press conference	As needed based on public consultation	Comments and suggestions on operational impacts, public opinions	Experts of various sectors, media	Not yet started
Notes: FFPMO = Foreign-funded project management office; IA = implementing agency; O&M = operation and maintenance					

3.2 Project Grievance Records and Resolution

No complaint had been received to date including the reporting period. The grievance redress mechanism (GRM) consists of a 3-step procedure as described below and shown in Figure 4. Table 15 shows the complaint hotline numbers and personnel responsible for handling complaints.

Step 1: For environmental issues during the construction stage, the affected persons can register their complaints directly with the contractors. Contractors are required to set up a complaint hotline and designate a person in charge of handling complaints, and advertise the hotline number at the main entrance to each construction site. The contractors are required to maintain and update a Complaints Register to document all complaints. The contractors are also required to respond to the complainant in writing within seven calendar days on their proposed solution and how it will be implemented. If the problem is resolved and the complainant is satisfied with the solution, the grievance is considered addressed. The contractors are required to report complaints received, handled, resolved and unresolved to Anhui Province Department of Transport (APDOT) FFPMO monthly.

Step 2: For environmental issues that cannot be resolved by the contractors, the affected person can take the grievance to the implementing agency (IA) local project management offices (LPMOs) and local environmental protection bureaus (EPBs). On receiving complaints by the IA LPMOs or local EPBs, the party receiving the complaints must notify the other party and document the complaint in writing in a Complaints Register. The IA LPMOs and local EPBs must reply to each complainant in writing within 14 calendar days with the proposed solution and method of implementation. If the issue is resolved and the complainant is satisfied with the solution, the IA LPMOs and local EPBs should document the complaint and resolution process in its Complaint Register, with monthly reporting to APDOT FFPMO.

Step 3: If the complainant is not satisfied with the proposed solutions in Step 2, he/she can, upon receiving the reply, take the grievance to the APDOT FFPMO complaints center. Upon receiving the complaint, the center must deal with it within 14 calendar days. Once a complaint is documented and put on file, the APDOT FFPMO complaints center will immediately notify ADB. After discussing the complaint and potential solutions amongst ADB, APDOT FFPMO and the ESE, the complainant and the contractor, APDOT FFPMO must propose a resolution strategy within 14 calendar days from when the complaint is registered.

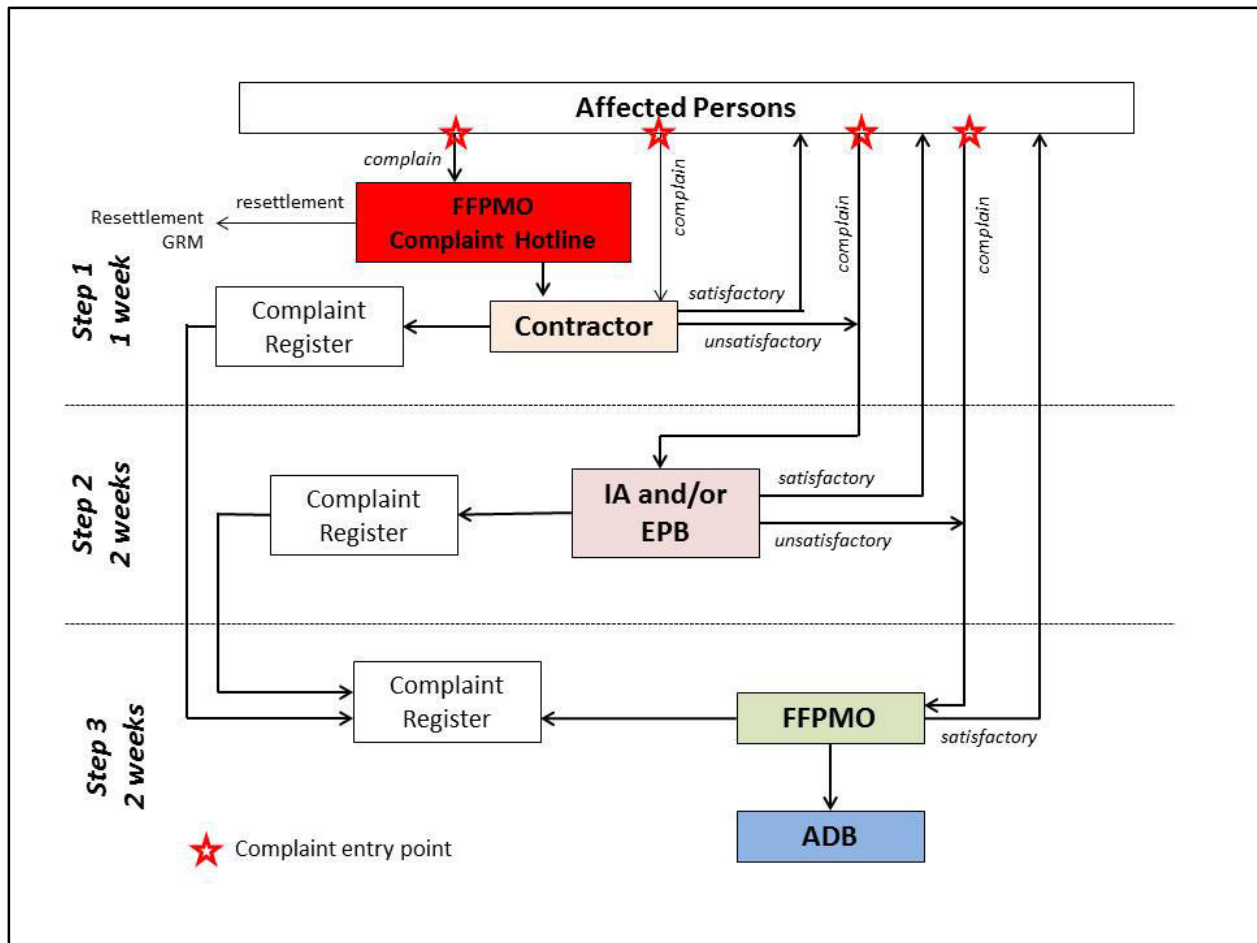


Figure 4: Project specific grievance redress mechanism

Table 15: Complaint hotline numbers and personnel for the grievance redress mechanism

Subproject	Hotline Number	Staff & Organization	Telephone Number
Foreign-funded project management office	0551-63756194	XU Benqing, FFPMO	152 5515 0716
IV: G206 Dongliu to Yaodu Section	0566-7026620	WEN Fadong, Chizhou City Highway Administration Bureau	180 5667 3190 or 139 5689 8908
		Dongzhi County Environmental Protection Bureau	0566-7019187

4 COMPLIANCE WITH EMP REQUIREMENTS

Site inspections during the reporting period revealed that most of the EMP requirements were implemented (see Appendix 1). Isolated incidents related to unsatisfactory construction site practices were observed, mainly on site drainage, maintenance of sedimentation tanks and scattering of refuse and construction and demolition wastes. Corrective actions were identified as described below, which will be followed up in the next reporting period.

4.1 Required Corrective Actions

Based on site inspections, the following corrective actions were recommended and will be undertaken in the next reporting period:

- (i) Fugitive dust problems were observed due to inadequate watering. Corrective action to increase watering activities of unpaved site areas will be needed.
- (ii) Overflowing of sedimentation tanks in asphalt/concrete mixing stations was observed. Sedimentation tanks will need to be cleaned and maintained regularly to prevent overflow.

- (iii) Materials were observed to be stockpiled higher than the surrounding hoardings/walls, creating wind-blown dust. Dusty materials need to be stockpiled no higher than the height of surrounding hoardings/walls.
- (iv) Process wastewater from Contract NO2-2 asphalt/cement mixing station was observed to flow over paved areas into the sedimentation tanks. Drainage ditches need to be constructed for collecting overland flow of process wastewater and directing the wastewater into the sedimentation tanks.
- (v) Inadequate environmental management by site staff was observed due to lack of knowledge and awareness. Site management staff needs to alert the environmental supervision engineer immediately should environmental problems be observed on site.

5 APPENDICES

5.1 APPENDIX I: STATUS OF EMP COMPLIANCE

Table A.3: Generic Impacts and Mitigation Measures

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
Detailed Design Stage					
See Project Specific EMPs		Ensure that the mitigation measures are adopted in detailed design	<ul style="list-style-type: none"> ● APDOT PPMO to appoint ESE 	Complied. Beijing Zhongzi Huayu Environmental Protection Technology Co. Ltd. was commissioned as the ESE through open tendering	None
Pre-construction Phase					
Institutional strengthening	-	Lack of environment management capacity within APDOT PPMO	<ul style="list-style-type: none"> ● Appoint one qualified environment specialists to APDOT PPMO. ● Appoint one Environmental Monitoring Station to conduct environment quality monitoring during construction stage. ● ESE to conduct first phase of environment management training for APDOT PPMO staff and environmental specialists. ● ESE to conduct environmental management training for contractors 	<p>Complied.</p> <p>Dongzhi Countyh EMS commissioned</p> <p>Complied.</p> <p>Complied</p>	None
	-	Lack of environment management and monitoring capacity within IA LPMOs	<ul style="list-style-type: none"> ● Each IA establishes LPMO and appoints one qualified environmental specialist to staff ● ESE to conduct initial environment management training for the IA LPMOs. ● ESE to provide follow on training. 	<p>Complied</p> <p>Complied</p> <p>Complied</p>	None
EMP update	-	-	<ul style="list-style-type: none"> ● Review mitigation measures defined in the EMP. ● Update as required to reflect detailed design. ● Submit to ADB/PPMO for approval and disclose updated EMP on project website. ● Prepare an environmental compliance monitoring plan to meet the environmental requirements in the EIA and EMP. 	<p>Complied</p> <p>No need to update during the reporting period</p> <p>Complied</p>	None
Grievance redress mechanism	Social & environmental	Handling and resolving complaints by	<ul style="list-style-type: none"> ● Establish a GRM, appoint a GRM coordinator within APDOT PPMO, each IA LPMO and each contractor. 	Complied	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
		contractors	<ul style="list-style-type: none"> Brief and provide training to GRM access points. Disclose GRM to affected people before construction begins at the main entrance to each construction site. 	Complied Complied	
Tender documents		Environmental and social impacts	Ensure that the construction-related environmental and social mitigation measures are incorporated into the tender documents. This should include a clause to employ a proportion of locally sourced workforce.	Complied	None
Construction traffic	Traffic	Construction vehicles causing traffic congestion	<ul style="list-style-type: none"> Plan transport routes for construction vehicles. Specify approved routes in the tender documents and forbid vehicles from using other roads especially during peak traffic hours. Inform drivers of haulage routes Separate construction traffic from pedestrians. Do not allow local villages to walk through construction sites. 	Complied Complied Complied Complied	None
Construction Stage					
Construction site good practice	Soil resources	Soil stripping	<ul style="list-style-type: none"> Strip topsoil and subsoil and store the soil horizons separately, protecting the top soil for reuse in restoration. Stockpiles are not to exceed 2m with side slopes at the natural angle of repose. Topsoil to be stored for a long time may be seeded with grass. 	Complied Complied Complied	None
	Soil resources	Soil erosion	<ul style="list-style-type: none"> Ensure contractors are aware of all soil erosion requirements as set out in the approved Water and Soil Conservation Plans and have developed appropriate method statements and management proposals. Where possible, avoid construction during periods of high rainfall. If necessary, construct berms to direct rainwater runoff away from exposed surface. Install drainage ditches and sedimentation pits in temporary construction areas to prevent soil erosion and to manage site run-off. Stabilise all cut slopes, embankments and other erosion-prone working areas while works are ongoing. Implement permanent stabilisation measures as soon as possible, at least within 30 days. Pay close attention to drainage provision and establishment of vegetation cover on backfilled areas to prevent soil erosion. 	Complied Basically complied Complied Basically complied Complied	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
	Soil resources	Soil contamination	<ul style="list-style-type: none"> ● Properly store petroleum products, hazardous materials and wastes on an impervious surface and preferably with a tray or bund to contain any leaks. ● Develop spill response plan. Keep a stock of absorbent materials (e.g. sand, earth or commercial products) on site to deal with spillages and train staff in their use. ● If there is a spill, take immediate action to prevent pollution entering drains, watercourses, unmade ground or porous surfaces. Do not hose the spillage down or use any detergents. Use oil absorbents and dispose of used absorbents at a licensed waste management facility. ● Record any spill events and actions taken in environmental monitoring logs and report to ESE; and ● Remove all construction waste from the site to licensed waste disposal sites. 	<p>Complied</p> <p>Not complied</p> <p>Did not occur during the reporting period</p> <p>Did not occur during the reporting period</p> <p>Complied</p>	<p>Each contractor to develop a spill response plan, keep stock of absorbent materials on site and train staff in their use</p>
Construction site good practice	Air quality	Dust (TSP) during construction	<ul style="list-style-type: none"> ● Erect hoarding / screens around dusty activities such as demolition; ● Frequent watering of unpaved areas, backfill areas and haul roads to suppress dust; (at least twice per day and during windy weather, once every two hours) ● Pay particular attention to dust suppression near sensitive receptors such as schools, hospitals, residential areas and natural areas; ● Manage stockpile areas to avoid mobilisation of fine material, cover with tarpaulin and/or spray with water; ● Minimise storage time of construction materials and wastes on site by regularly removing them off site; ● Equip trucks transporting fine grained materials with covers or tarpaulin to cover loads during transport; ● Plan the transport routes and timing to avoid busy traffic and heavily populated areas; ● Harden the main construction roads and sites; ● Mud dumping, transport and other construction activities likely to give rise to dust are not permitted during windy weather (level 4 wind); and 	<p>Basically complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	<p>None</p>

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
		Fumes and PM from asphalt mixing plant, concrete batching plant and other equipment and machinery	<ul style="list-style-type: none"> ● Locate asphalt plants and mixers at least 300m downwind from residential areas and other sensitive receptors. ● Enclose these plants and equip them with bag house filter or similar air pollution control equipment. ● Regularly inspect and certify vehicle and equipment emissions and maintain to a high standard. 	<p>No such facility in the reporting period</p> <p>No such facility in the reporting period</p> <p>Complied</p>	None
	Air Quality	Emissions from vehicles and equipment	<ul style="list-style-type: none"> ● Procurement of new vehicles and plant should take account of low emission alternatives; ● All vehicles and plant to be kept in good order and maintained in compliance with the manufacturer's instructions; ● Minimise movement of construction traffic around the site; ● Set up speed limit signs on construction sites; ● On road vehicles are to comply with vehicle emissions standards; ● Prohibit the burning of waste on site; and ● Vehicles and plant shall be switched off when not in use. 	<p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	None
	Noise	Noise from powered mechanical equipment and vehicles	<ul style="list-style-type: none"> ● Sensibly schedule construction activities, avoid noisy equipment working concurrently. ● Specify equipment and machinery that conforms to PRC noise standard GB12523-90 and ensure regular maintenance. ● Select advanced quiet equipment and construction method, and tightly control the use of self-provided generators. ● Comply with local requirements in areas with sensitive receptors very close by, avoiding construction works, particularly noisy activities such as piling and compaction from 2200 to 0600. ● If night time construction needed, inform nearby residents beforehand, obtain permission of local government, keep local communities informed through bulletins, avoid using noisy equipment and set up temporary noise barriers. ● Control the speed of bulldozer, excavator, crusher and other heavy plant travelling on site. ● Locate sites for rock crushing, concrete mixing and other noisy activities at least 300m away from sensitive noise receptors. 	<p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
			<ul style="list-style-type: none"> Minimize the use of whistles and horns, and prohibit the use of horns on construction sites at night. 	Complied	
	Natural drainage lines	Control of drainage and flooding on site	<ul style="list-style-type: none"> Provide temporary drainage at construction sites Provide pollution control such as oil and silt traps at discharge points where hydrocarbons and aggregate may contaminate runoff Take measures to reduce the risk of soil erosion on exposed surfaces prior to the start of the heavy summer rains. 	Complied Complied Complied	None
	Water Quality	Management of works in and adjacent to watercourses	<ul style="list-style-type: none"> Programme in channel works during the dry season. Use coffer dams for construction of bridge foundations for ease of construction in the dry and minimize turbidity in the river. Construction water is treated via settlement pit prior to re-use or discharge to surface waters Erect berms or sandbags during bridge foundation works if necessary to contain runoff polluting the rivers. All camps, fuel storage, refuelling and maintenance areas to be located at least 200m from watercourses. Construction materials such as aggregate and cement must be protected from rainfall and runoff to prevent erosion 	Basically complied Slurry from piling diverted to settling ponds Complied Not yet necessary in the reporting period Complied Complied	None
		Construction site wastewater discharge	<ul style="list-style-type: none"> Provide temporary toilets sufficient for the size of the workforce at canteens, construction camps and major construction sites. Septic tanks must be emptied periodically and the contents transported to the Municipal wastewater treatment plant for treatment or be spread on agricultural land. All construction wastewater to be treated to appropriate PRC standard prior to discharge to surface waters. Stockpiles should have temporary drainage provisions to minimise run-off. Install sedimentation tanks on site to treat process water and muddy runoff. 	Complied Complied Complied Complied Complied	None
	Solid waste	Spoil	<ul style="list-style-type: none"> Balance cut and fill on construction sites to minimize the amount of spoil to be disposed; Spoil disposal sites must be approved in advance; Revegetate spoil disposal sites at the earliest 	Complied Complied Not yet occurred in the	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
			opportunity.	reporting period	
		Construction site refuse	<ul style="list-style-type: none"> ● Set up centralized domestic and construction waste collection point(s). ● Sort material on site, for reuse, recycling and disposal. ● Identify final disposal routes and approved sites. ● Use covered dump truck to remove construction and demolition waste. ● Appoint a named individual to manage the waste disposal. ● Prohibit the burning of waste on construction sites. 	<p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	None
	Ecology	Protection of vegetation and restoration of disturbed areas	<ul style="list-style-type: none"> ● Demarcate the construction working area to prevent encroachment and damage to adjacent areas. ● Ensure any valuable trees that are being retained are protected with fencing and/or put conspicuous markings and warning signs on these trees to prevent workers from inadvertently damaging or destroying them. 	<p>Comply</p> <p>Comply</p>	None
		Protected species	<ul style="list-style-type: none"> ● Prohibit any injury to key protected animals, such as the Asiatic toad and turtle. ● If any injured animals are found, report to local wildlife protection department. 	<p>None found on site in the reporting period</p> <p>None found on site in the reporting period</p>	None
			<ul style="list-style-type: none"> ● Qualified ecologist will be on site prior to start of construction to check construction sites for protected species and translocate any discovered on site 	Complied	None
		Greening	<ul style="list-style-type: none"> ● Implement the revegetation plans, which may include seeding with grass and planting trees and shrubs. 	Not yet occurred in the reporting period	None
	Physical cultural resources	Destruction of cultural relics	<ul style="list-style-type: none"> ● Contractor to comply with PRC's Cultural Relics Protection Law and Cultural Relics Protection Law Implementation Regulations ● If relics are discovered, stop work immediately and protect the site; notify the supervising entities and the local Cultural Relics Bureau; and only start construction after approval by the Cultural Relics Bureau; ● Educate workforce on these procedures. 	<p>Complied</p> <p>None found on site in the reporting period</p> <p>Complied</p>	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
Health and Safety	Occupational health and safety	Construction site sanitation	<ul style="list-style-type: none"> Effectively clean and disinfect the site, including disinfection of toilets and waste disposal sites, and ensure timely removal of solid waste; Exterminate rodents on site at least once every 3 months, and exterminate mosquitoes and flies at least twice each year; Provide public toilets in accordance with the requirements of labor management and sanitation departments in the living areas on construction site, Appoint designated staff responsible for cleaning and disinfection. 	<p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	None
		Occupational safety	<ul style="list-style-type: none"> Appoint Environment, Health and Safety Officer to develop and implement environmental, health and safety management plan, maintain records concerning health, safety and welfare and regularly report on accidents, incidents and near misses. Train all construction workers in general health and safety matters and on emergency preparedness and response procedures. Provide personal protective equipment (hard hats, shoes, eye goggles, respiratory masks, and high visibility vests) to all construction workers and enforce their use. Provide goggles and respiratory masks to workers doing asphalt road paving. Provide ear plugs to workers working near noisy powered mechanical equipment (PME), especially during piling of bridge foundations. Provide a clean and sufficient supply of fresh, potable water for all camps and work sites. Provide 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 adequate waste receptacles and ensure regular collection and disposal. Ensure that Contractors have adequate worker and third party insurance cover. No children (less than 14 years of age) to work on any contract. 	<p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Not yet occurred in reporting period</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	None
		Food safety	<ul style="list-style-type: none"> Provide a secure source for drinking water at the construction camps Inspect and supervise food hygiene in canteens on 	<p>Complied</p> <p>Complied</p>	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
			<p>site regularly.</p> <ul style="list-style-type: none"> ● Canteen workers must have valid health permits. ● Once food poisoning is discovered, implement effective control measures immediately to prevent it from spreading 	<p>Complied</p> <p>None occurred in reporting period</p>	
		Disease prevention and safety awareness	<ul style="list-style-type: none"> ● Construction workers must have physical examination before start working on site. ● Provide annual health checks. ● If infectious disease is found, the patient must be isolated for treatment to prevent the disease from spreading. ● Establish health clinic at location where workers are concentrated, which should be equipped with common medical supplies and medication for simple treatment and emergency treatment for accidents. ● Specify the person responsible for health and epidemic prevention responsible for the education and propaganda on food hygiene and disease prevention to raise the awareness of workers. ● Regularly inspect works to ensure there are no areas of stagnant water that could provide breeding grounds for malaria, encephalitis and dengue fever mosquitoes. ● Regularly inspect works to ensure that there are no breeding grounds for the host snail for schistosomiasis ● Provide training to the workforce on disease prevention and safety awareness ● Undertake checks every six months for workforce working in areas / tasks with a moderate to high risk of contact with schistosomiasis and medicate if the disease is found. ● Inform the local Schistosomiasis Prevention and Treatment Office and report the incidence to the local Health Administrative Department 	<p>Complied</p> <p>Not yet necessary in reporting period</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Not on Chinese List</p> <p>Complied</p> <p>Complied</p> <p>Checks were carried out and no disease was found in reporting period</p> <p>Complied</p>	<p>None</p>
	Community health and safety	Temporary traffic management	A traffic control and operation plan will be prepared together with the local traffic management authority prior to any construction. The plan shall include provisions for identifying preferred haul routes, diverting or scheduling construction traffic to avoid morning and afternoon peak traffic hours, regulating traffic at road crossings with an emphasis on ensuring public safety through clear signs, speed controls and planning in advance.	Complied	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
		Information disclosure	Residents and businesses will be informed in advance through publicity about the construction activities and provided with the dates and duration of expected disruption.	Complied	None
		Access to construction sites	<ul style="list-style-type: none"> ● Clear signs will be placed at construction sites in view of the public, warning people of potential dangers such as moving vehicles, hazardous materials, excavations and raising awareness on safety issues. ● All sites will be made secure, discouraging access by members of the public through fencing or security personnel, as appropriate. 	Complied Complied	None
		Utility services interruptions	<ul style="list-style-type: none"> ● Assess construction locations in advance for potential disruption to services and identify risks before starting construction. ● Communicate the dates and duration in advance to all affected people. 	Complied Complied	None
Demobilisation	Site cleanup	Site remediation and restoration	<ul style="list-style-type: none"> ● Contractor to keep a schedule of all temporary land prior land use, and land occupiers ● At the end of construction, all buildings, stockpiles, and litter on temporary land is to be removed. ● Temporary land is to be restored to its original land use, unless agreed otherwise with the land occupier. ● Borrow pits and spoil disposal sites are to be restored according to the approved plans and will be subject to approval by APEPD / local EPB during the environmental acceptance review on completion. ● Latrines must be removed and the site disinfected and infilled. Sewage sludges may be spread on agricultural land. 	Complied Complied Complied Complied	None
Grievance redress mechanism	Social & environmental	Handling and resolving complaints by contractor, IA LPMOs and APDOT PPMO	<ul style="list-style-type: none"> ● Disclose GRM to affected people before construction begins at the main entrance to each construction site. ● Maintain and update a Complaints Register to document all complaints. ● Ensure satisfactory resolution of complaints within specified timescales. 	Complied Complied Complied	None
Operational Stage					
Environmental management	Operation activities	EMP	<ul style="list-style-type: none"> ● Prepare an EMP to address potential impacts, mitigation and monitoring needs, and institutional 	Not yet necessary in the reporting period	None

	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Action
			requirements for the operations phase		
		Emergency planning	<ul style="list-style-type: none"> • Prepare an emergency response plan 	Not yet necessary in the reporting period	None

Table A.8a: Specific Mitigation Measures for the Improvement Works of G206 Dongliu to Yaodu

Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Actions
Detailed Design Stage					
Conservation of soil and land resources	Soil resources	Loss of land and topsoil and increased risk of erosion	<ul style="list-style-type: none"> Minimise permanent and temporary landtake for development. Retain/incorporate landscape features of interest in design. Optimise balance between cut and fill and avoid deep cuts and high embankments to minimise earthworks. Maximise reuse of spoil within the construction or adjacent construction works. Agree spoil disposal sites, management and rehabilitation plan with APEPD/local EPB. Remove and store topsoil (10-30cm) for restoration works prior to main earthworks. Design appropriate drainage systems for slopes to reduce soil erosion. 	Complied Complied Complied Complied Complied Complied	None
Design of road alignment, road surface, drainage and lighting	Extreme weather events due to climate change	Road surface cracking due to extreme hot or cold weather, landslide and flooding due to torrential rainfall	<ul style="list-style-type: none"> Consider potential impacts from extreme weather events due to climate change in designing road subgrade, pavement, road-side slopes, drainage system, bridges and culverts. Adopt appropriate protective measures such as vegetation cover, geotextiles, settling basins, permeable paving, infiltration ditches, stepped slopes, riprap, crib walls, retaining walls and intercepting ditches to reduce the speed of surface run-off. 	Complied Complied	None
	Health and safety	Promotion of non-motorized transport, protection of vulnerable road users	<ul style="list-style-type: none"> Design must ensure public health and safety. Promote non-motorized traffic. Ensure barrier-free design for disabled people. 	Complied Complied Complied	None
	GHG emissions	Energy efficiency	<ul style="list-style-type: none"> Consider energy efficient street lighting, such as LEDs or solar-powered lights 	Complied	None
G206 Dongliu to Yaodu section	H&S	NMT and pedestrians	<ul style="list-style-type: none"> Review the need for pedestrian walkways along this alignment and provision of pedestrian crossings for this dual three lane highway 	Complied	None
Construction Stage					
Implementation of mitigation measures	Traffic Noise	Protection of noise sensitive receptors	<ul style="list-style-type: none"> Provide noise insulation for windows at 94 households in the sensitive receptor clusters in Weizhuang, Zhanggang, Liuchun Village and the farm dormitory. 	Not yet started in reporting period	None
	Slope Stability	Protection of new cuttings	<ul style="list-style-type: none"> Take care during excavations of deep cuttings to avoid creating slope collapse and mass movements. Use appropriate techniques to stabilize the slopes, including geo-technical, slope reinforcement and planting options. Install drainage to the top of the slope. 	Complied Complied Complied	None

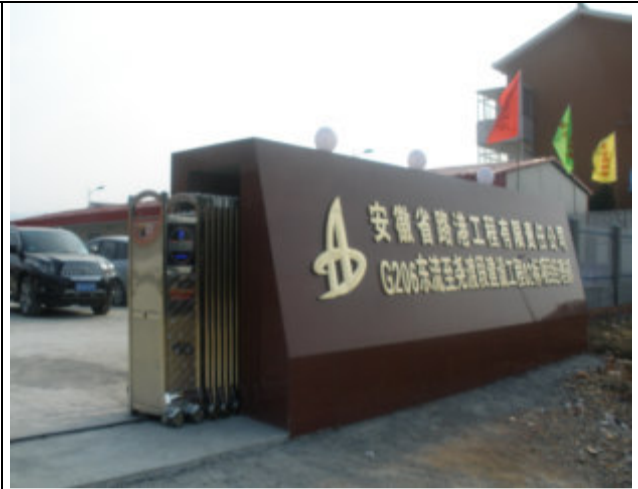
Item	Impact Factor	Potential Impact and/or Issues	Mitigation Measures	Compliance	Corrective Actions
	Ecology	Protection of natural habitats	<ul style="list-style-type: none"> ● Minimize the construction programme for the sections between K0+000 to K2+300 and K15+000 to K16+580 to reduce impact on ecological features. ● Avoid noisy activities such as blasting between the main bird nesting season May and June. ● Prohibit blasting in the morning and at night. ● Walkover survey prior to construction by trained wildlife and forestry experts to confirm works can go ahead. ● Identify trees to be preserved and clearly mark them, translocate other trees to new locations, and ensure adequate aftercare ● If any protected species are observed along the alignment, take advice from ecologist on appropriate measures for translocation. ● Provide environmental training on the importance of protecting habitats and wildlife to construction workforce ● Prohibit the collection of timber, non-timber forestry products, hunting, and fishing in the Forestry Reserve by the construction workforce. ● Prohibit the setting of fires in the woodland sections of the alignment. 	<p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p> <p>Complied</p>	None
Operational Stage					
Road maintenance and safety	Traffic	Road condition	Regularly inspect and maintain the road surface and clean up the drains.	Not yet started in reporting period	None
		Road safety and traffic accidents	Strictly enforce traffic laws to improve road safety and reduce traffic accidents.	Not yet started in reporting period	None

5.2 APPENDIX II: ADDITIONAL INFORMATION

5.2.1 Representative Photographs for Subproject IV: G206 Dongliu to Yaodu Section



Contract NO2-1 project office



Contract NO2-2 project office



Contract NO2-1 construction camp



Warning sign on no hunting



Warning sign on forest fire prevention



Box culvert at K0+127



Cement sprayed on culvert sides to minimize soil erosion



Terraced soil excavation to minimize soil erosion



Temporary drainage ditch during subgrade works to minimize soil erosion



Access road at K13+800 paved with gravel to minimize fugitive dust emission



#1 borrow area at K1+500



#2 borrow area at K6+800



Borrow area across from the site office



Borrow area at K14+100



#1 spoil disposal site at K3+500



#2 spoil disposal site at K6+300



3 spoil disposal site at K11+120



Toilet on construction site



Interception ditch needed to direct process wastewater to sedimentation tank in asphalt mixing station



Wheel washing bay in asphalt mixing station



Drainage ditch in asphalt mixing station



Interception ditch in asphalt mixing station



4-chamber sedimentation tank in NO2-1 asphalt mixing station



3-chamber sedimentation tank in NO2-2 asphalt mixing station



Water sampling



Stakeholder interview



Local PMO suggestion/complaint box



Contract NO2-1 suggestion/complaint box



Contract NO2-2 suggestion/complaint box

5.2.2 Representative Photographs of Meetings, Seminars and Workshops



Environmental awareness training



ADB environmental workshop



Site inspection and meeting



Environmental management training



First site seminar



Training for PMO and IA