



Environmental Monitoring Report

Project Number: 39149
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PRC: Western Guangxi Roads Development

Prepared by Guangxi Environmental Monitoring Center

Nanning, PRC

For Guangxi Communications Department
Longlin-Baise Expressway Development

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**Communication Environmental Monitoring Center
Of Guangxi Zhuang Autonomous Region**

**MONITORING REPORT
(2nd Biannual Report in 2009)**



Project Name: Environmental Monitoring in Construction Period of Longlin – Baise Expressway Project and local road component Project

Entrusted by : Longlin – Baise Express Highway Development Co. Ltd.

Category: Commission Monitoring

Date of Report: Jan. 25th, 2010

Communication Environmental Monitoring Center of
Guangxi Zhuang Autonomous Region



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Chapter 1 Environmental Impact and Monitoring of Main Route of Longlin-Baise Express Highway

1. Source of Tasks and Overview of Environmental Protection of the Project

Entrusted by Longlin – Baise Express Highway Development Co., Communication Environmental Monitoring Center Of Guangxi Zhuang Autonomous Region started to conduct monitoring to the main route of Longlin – Baise Express Highway Project, including 4 local roads, during its construction period from Dec. 2008. It is intended to provide the construction units with environmental management basis and reduce environmental pollution generated during construction of the highway by monitoring the ambient air, noise in the sensitive points within 60m to the construction sites as well water quality of the surface water bodies that the planed highway crosses. It is intended to monitor the ambient air and noise in the sensitive points within 60m to the construction sites and water quality of the surface water bodies that the planed highway crosses so as to provide construction units with environmental management basis, reduce environmental pollution generated during highway construction, carry out supervision to construction activities based on various environmental impacts during construction period and urge construction units to standardize their construction according to the mitigation measures proposed by EIA.

In accordance with the requirements in *Technical Service Contract for Environmental Monitoring of Longlin – Baise Express Highway during Construction Period* as well as *Environmental Impact Assessment on Longlin – Baise Express Highway*, ambient air, acoustic and water environments have been identified as monitoring objects during the construction period based on the findings of field reconnaissance. For ambient air, the monitoring item is TSP and CO; for acoustic environment, they are Leq, L₁₀, L₅₀ and L₉₀; and for water environment, they're pH, SS, DO, COD_{MN}, NH₃-N and petroleum.

This report summarizes the monitoring results as well as implementation status of environmental protection measures for main route of during construction period from Jul. 2009 to Dec. 2009. Monitoring to the main route of Longlin – Baise Express Highway was conducted once every month.

2. Construction Status and Major Environmental Impacts during the first Half of 2009

2.1 Analysis on Ambient Air Impact during Construction Period

From Dec. 2008 to Jun. 2009, the major content of the project includes ground leveling, dredging, subgrade construction and piling for bridge. The main construction processes generating impact to ambient air are transport, loading and unloading of materials, cut and fill, emission of exhausted gas by construction machines and vehicles with TSP and CO as major pollutants.

Spraying water is a simple and effective way to control fugitive dust. During construction period, to spray water on the road surface where vehicles pass through for four to five times every day can reduce fugitive dust by 70%. Experiences for other highway construction projects reveal that to spray water in construction sites for 4 ~ 5 times every day can effectively control fugitive dust generated in construction process and limit pollution scope of TSP to within 20 ~ 50m to dust source.

In conclusion, TSP is the major pollution in this period. It is suggested to increase frequency of water spraying in construction site and construction time to greatly mitigate the TSP pollution.

2.2 Prediction and Evaluation to Acoustic Environment Impact during Construction Period

Noise pollution during construction period mainly comes from various large construction machines. Their noise can be taken as point source of pollution. Table 1 shows the predicted noise level with different distance to various construction machines, which is calculated based on the reference machine noise levels proposed by *EIA Standard for Highway Construction Project* as well as the reference levels estimated by analogy survey method.

Table 12 Noise Level of Highway Construction Machine

Unit: Leq[dB(A)]

No.	Type of Machine	Model	Distance from Monitoring Point to Construction Machine (m)	Max. Acoustic Level L_{max} (dB (A))
1	Wheel loader	ZL40	5	90
2	Wheel loader	ZL50	5	90
3	Motor grader	PY16A	5	90
4	Vibration roller	YZJ10B	5	86
5	Double-driving and double-vibrating roller	CC21	5	81

6	Macadam roller		5	81
7	Wheel roller	ZL16	5	76
8	Bulldozer	T140	5	86
9	Hydraulic wheel scraper	W4-60C	5	84
10	Generators (2)	FKV-75	1	98
11	Percussion drill	22	1	87
12	tapered reverse tilting concrete mixer	JZC350	1	79

2.3 Analysis on Water Environment Impact during Construction Period

During construction period, water environment pollution caused by the planed highway mainly comes from disturbance of bridge construction to water bodies and discharge of wastewater by construction staff. Besides, if construction materials piled near water bodies is washed away by river flow or blown into rivers due to improper management, the quality of water bodies will also be affected to certain extent.

● Construction of Bridges

a. Analysis on Impact of Construction Wastes, Slurry and Sludge to Water Environment

The planed highway will cross quite a number of water bodies like rivers and reservoirs. It is determined that box girder is the most popular form of superstructure for river-crossing bridges while pile foundation and bored grouting pile foundation will be widely used in pier construction. Construction of underwater pile foundation will be required in some cases subject to the width of water bodies where bridges cross.

① large amount of solid waste, slurry and wastewater will be generated in construction since the scale of pile foundation construction is fairly large and large depth of drilling is required, liable to cause water environment pollution;

② since reinforced concrete arch abutment is applied in the project and concrete pouring is used in construction of bridge pier, waste concrete and wastewater generated in bridge maintenance will also lead to the rise of SS concentration in the water.

③ as the pile foundation is near the banks, the settling and recycling tanks for the slurry used to reinforce the stack in the construction of bored grouting pile foundation are often set at the bank. The slurry will be conveyed to construction and recovered to the bank through enclosed pipeline. Thus, the process will not cause water pollution.

. Impact of Waste Oil Generated by Construction

Currently, no impact of waste oil will be brought since various large structures used in bridge engineering will be precast in prefabrication sites and then hoisted to construction sites for installation. However, in construction of pile foundation, oil leaked from construction machines may enter water bodies after being washed by rainfall, which will result in increase of petroleum concentration. Fortunately, the volume of such waste oil is very small so that it will not bring severe pollution.

c. Impact of Domestic Wastewater Discharged from Construction Campsites

Construction of the project will last 4 years. Bridge construction should be arranged in season and section. According to estimation standard of 1 campsite per 10km, it is necessary to set 20 campsites during 1400 days (2-year construction period). Assumed that there are 50persons in each campsites and volume of discharged domestic wastewater per person is 150 L/p.d, the total discharge volume of the wastewater will be 210,000m³ respect

In most cases, the existing residential houses will be rented or temporary shelters will be built as campsites. The domestic wastewater discharged from rented campsites will be used as agricultural fertilizer after being treated with existing facilities. For the campsites far away from residential areas, tertiary septic tanks will be set for standard-compliance treatment so that wastewater discharged by construction campsites will not bring pollution to surrounding environment.

d. Impact of Sheet Erosion Caused by Rainfall to Water Environment

In construction period, many cut and fill sideslope will be exposed. When storm comes, large amount of soil will enter surrounding water bodies, seriously affecting local water environment and even blocking flood way and burying farmland. Thus, it is important to protect these exposed sideslopes.

Consideration should be taken into adopting plastic film to cover the cut or fill sideslopes, heaps of surface soil, heaping sites of materials and prefabrication sites without proper protection measures, or use geotextile bags to build retaining walls around heaps of surface soil and heaping site of materials.

2.4 Construction Impact on Chengbi Lake Nature Reserve

In construction of express highway, SS, sediments, oil and fat will be leaked into reservoir

in the process of drilling, cast of pier and installation of bridge deck. Mitigation measures include: a) proper maintenance should be made to construction machine before it is used in reservoir so as to avoid leakage of fuel and water; b) all slurry generated in drilling should be pumped to settling tank on the bank via collectors; c) contractors who carry out implementation in or around reservoir should work out an appropriate leakage prevention scheme so that prompt actions can be taken if leakage emergency happens; d) setting of construction campsites, storage of wastes and equipment is forbidden within 145km ~ 152km to the buffer zone and experimental zone of the nature reserve.

3. Location of Monitoring Points, Monitoring Frequency, Items and Methods

1) Location of monitoring points and monitoring items

Monitoring points for ambient air and noise mainly include sensitive areas within 60m to the highway such as villages and schools while the focus of water quality monitoring are Chengbi lake Reservoir and Tangxing Reservoir. Please find table 2 and annex 1 for overview of monitoring points and photos of sensitive points.

Table 2 Location of Monitoring Points and Monitoring Items

No.	Name of Village	Pile No.	Distance to Roadside (m)	Number of Households in the first row facing the road	Elevation difference between point and road surface (m)	Surrounding Environment
Noise and ambient air monitoring points in Jul. 2009						
1	Weile Village	K6+200	10m to the left	5	+5.0	As the former location of Weile Township government the village is surrounded by pine woods and National Highway S324 passes its northwestern corner.
2	Weile Primary School	K6+300	10m to the right	—	-2.0	With paddy field at the both sides, planed highway in the front and a hill at the back, the school has 2 three-stored teaching buildings.
3	Muchang Primary School	K22+380	100m to the left	—		Without enclosed wall at the side backing against the hill, the school has 2 rows of one-store classrooms. There are 134 students and 5 teachers in the school.
4	No. 14 mixing station					
5	Jiuzhou Town	K40+600	30m to the left	4	-10	Most part of the town is far from the planed highway. There is a market facing the highway with dense frame buildings. Most of them are lower than the highway.
6	Pingji Village	K76+000	5m to the right	8	-3	Half of the houses there are two or three-stored brick-and-concrete composite buildings while the other half are brick and tiled buildings. A hill with flourishing vegetation is at the back while paddy field located at the both sides.
7	Hongqi Village	K87+ 800	60m to the right	7	-30	Distributed along the original class II highway, houses in the village are mostly brick-and-concrete buildings and quite dense. Most of them are facing the north .
8	Xinning Village	K95+700	27m to the right	7	-22	With a hill at the back and dry land in the front, the village has dense brick-concrete composite houses. There are some trees there.

9	Changzhai Village	K115+850	22m to the right	10	-1	With a hill at the back and dry land in the front, village is facing the south. There are dense brick-concrete composite houses there.
Noise and ambient air monitoring points in Aug. 2009						
1	Zhenian Village	K27+700	25m to the right	7	+10	Located at the halfway up the hill, the village has brick-and-concrete composite houses scattering on the hill. There are sparse trees between houses.
2	Pingman Primary School	K44+500	60m to the right	—		Facing a hill in the north and back against the highway as well as paddy field, the school has 100 students and 5 teachers.
3	Zhesu Village	K49+900	35m to the right	8	+2	At the left side of the old class II highway, houses in the village are mostly brick-and-concrete composite ones. There are flourishing trees around it.
4	No. 12 mixing station					
5	Lucheng Junior Middle School	K78+900	40m to the left	—	0	There is a 3-story teaching building accommodating 15 classes of 700 students and 47 teachers in the school. 500 of them live there.
6	Yanzhan Village	K90+600	20m to the right	4		In the village, there are dense houses distributed along the existing secondary highway. Most of them are brick-concrete composite ones and facing the north.
7	Liangba Village	K126+360	10m to the left	3	0	With Liangba Village in the front and hills at the back, the village is vertical to the planned highway. There is sparse vegetation but dense houses. Most of them are brick-and-concrete ones and equipped with aluminium alloy windows
8	Nani	K128+800	30m to the right	10	0	Stretching from the toe to the middle of a hill and surrounded by flourishing vegetation, the village has dense brick-concrete composite houses all equipped with aluminium alloy windows.
9	Nade Village	K132+500	20m to the right	9	-12	Surrounded by flourishing vegetation, the village is concentrated at the middle of a hill. Houses there are facing the south and most of them are 3-story ones.

Noise and ambient air monitoring points in Sep. 2009						
No.	Name of Village	Pile No.	Distance to Roadside (m)	Number of Households in the first row facing the road	Elevation difference between point and road surface (m)	Surrounding Environment
1	Shitoulin Village	K46+450	5m to the right	8	+5	Surrounded by woods and with a hill at the back, the village has dense house. Most of them are frame-structure.
2	Nashe Village	K65+800	5m to both sides	8	+4	With dense houses, the village is neighboring to the existing secondary highway. There are ponds and dry land in the front or at the back of most houses. The planed highway will cross the village center.
3	Lucheng Town	K78+900	40m to the left		-20	In the town, there are dense houses distributed along the existing secondary highway. Most of them are brick-concrete composite ones.
4	Hekou Village	K107+340	20m to the right	10	-5	Strechting from the toe to the middle of a hill and surrounded by flourishing vegetation, the village has dense brick-concrete composite houses all equipped with aluminium alloy windows.
5	Pingwang Village	K108+300	30m to the left	5	-6	Located on a hill and surrounded by flourishing vegetation, the village has dense brick-concrete composite houses all equipped with aluminium alloy windows.
6	Liangba Village	K126+360	10m to the left	3	0	Liangba Reservoir is in the front of the village and vertical to the planed highway while a hill is at its back with sparse vegetation. Houses there are dense and most of thme are brick-concrete composite ones all with aluminium alloy windows.
7	Nami	K128+800	30m to the right	10	0	Strechting from the toe to the middle of a hill and surrounded by flourishing vegetation, the village has dense brick-concrete composite houses all equipped with aluminium alloy windows.
8	Wanyu Village	K149+500	24m to the right	8	+8	Neighboring the existing National Highway 324, the village is on a earth hill. Most houses there are brick-concrete composite ones. There is vegetation around
9	No. 2 mixing station	K148+000				

Noise and ambient air monitoring points in Oct. 2009						
No.	Name of Village	Pile No.	Distance to Roadside (m)	Number of Households in the first row facing the road	Elevation difference between point and road surface (m)	Surrounding Environment
1	Bangba Village	K5+500	40m to the right	3	-2.8	Surrounded by bamboo woods, the village is located on a hill. Most of the houses are tiled ones. A stream separates it from the highway.
2	Weile Village	K6+200	10m to the left	5	+5.0	Surrounded by pine woods, the village is the location of former Weile Township Government. National Highway S324 is to its northwest.
3	Weile Village	K6+200	10m to the left	5	+5.0	Surrounded by pine woods, the village is the location of former Weile Township Government. National Highway S324 is to its northwest.
4	Pingman Village	K44+300	30m to the left	7		Back against a hill and facing paddy field, the village has dense houses. Most of them are frame-structure buildings.
5	Xinning Village	K95+700	27m to the right	7	-22	With a hill at the back and dry land in the front, the village has dense brick-concrete composite houses. There are some trees there.
6	Yanka Village	LK4+100		4	+5	Houses in the village are scattered on a hill. A stream flows through it and vegetation there is flourishing.
7	Nalai Village	LK5+200		6	+6	With a stream flowing through, the village is at the foot of the hill.
8	Nanka Village	LK11+100	30m to the left	5	+2	Sparsely distributed along the middle of a hill, the village is surrounded by woods. Most houses are frame-structure ones.
9	No. 9 mixing station	K100+200				

Noise and ambient air monitoring points in Nov. 2009						
1	Lawei Village	K5+200	20m to the left	2	-2.3	Surrounded by dense bamboo woods, the village is located on a hill. Most of the houses are tiled ones.
2	Weile Primary School	K6+300	10m to the right	—	-2.0	With farmland at both sides, the school has two 3-story teaching buildings and 2m high enclosed walls. The planned highway is at its front and a hill at its back.
3	Muchang Primary School	K22+380	100m to the left	—		Without enclosed wall at the side backing against the hill, the school has 2 rows of one-store classrooms. There are 134 students and 5 teachers in the school.
4	Pingnan Primary School	K44+500	60m to the right	—		Facing a hill in the north and back against the highway as well as paddy field, the school has 100 students and 5 teachers.
5	Bantao Village	K62+120	5m to both left and right	18		As the location of former township government and trading center for surrounding area, the village has east-west streets and south-north houses. Bantao Reservoir and a railway are to its south.
6	Nashe Village	K65+800	5m to both sides	8		With dense houses, the village is neighboring to the existing secondary highway. There are ponds and dry land in the front or at the back of most houses. The planned highway will cross the village center.
7	Pingji Village	K76+000	5m to the right	8	-3	Half of the houses in the village are 2-story or 3-story brick-concrete composite ones and the other half are tiled ones. A hill well covered by flourishing vegetation is at its back and paddy field are at both sides.
8	Lucheng Junior Middle School	K78+900	40m to the left	—	0	There is a 3-story teaching building accommodating 15 classes of 700 students and 47 teachers in the school. 500 of them live there.
Noise and ambient air monitoring points in Dec. 2009						
1	Nashe Village	K65+800	5m to both sides	8		With dense houses, the village is neighboring to the existing secondary highway. There are ponds and dry land in the front or at the back of most houses. The planned highway will cross the village center.
2	Hongqi Village	K87+ 800	60m to the right	7	-30	In the village, there are dense houses distributed along the existing secondary highway. Most of them are brick-concrete composite ones and facing the north.

No.	Name of Village	Pile No.	Distance to Roadside (m)	Number of Households in the first row facing the road	Elevation difference between point and road surface (m)	Surrounding Environment
3	Yanzhan Village	K90+600	20m to the right	4		In the village, there are dense houses distributed along the existing secondary highway. Most of them are brick-concrete composite ones and facing the north.
4	Pingwang Village	K108+300	30m to the left	5	-6	Located on a hill and surrounded by flourishing vegetation, the village has dense brick-concrete composite houses all equipped with aluminium alloy windows.
5	Xianke Primary School in Liangba Village	K126+450	10m to the right		0	With a 3-story teaching building facing the planned highway and no enclosed wall, the school has 6 classes of 190 students and 19 teachers.
6	Nami	K128+800	30m to the right	10	0	Stretching from the toe to the middle of a hill and surrounded by flourishing vegetation, the village has dense brick-concrete composite houses all equipped with aluminium alloy windows.
7	Wanyu Village	K149+500	24m to the right	8	+8	Neighboring the existing National Highway 324, the village is on a earth hill. Most houses there are brick-concrete composite ones. There is vegetation around
8	Xinzhai Village	LK15+200	10m to both sides	6	+3	Located in the middle of a hill, the village is surrounded by bamboo woods. Provincial Highway 332 is to the northeast and 300m far from it.
Water quality monitoring sections						
Upstream and downstream of the bridge crossing Chengbi River Reservoir			—		pH value, COD, DO, NH ₃ -N, SS and petroleum	
500m to the right of Tangxing Reservoir Bridge			—		pH value, COD, DO, NH ₃ -N, SS and petroleum	

Location of noise monitoring point is 1m in the front of sensitive houses while that for ambient air monitoring is 1m in front of the houses in the first row facing the planned highway.

2. Sampling Frequency

Please find table 3 for sampling frequency

Table 3 Sampling Frequency

Items	No. of monitoring days	Monitoring frequency (time/day)	Monitoring periods		Sampling time (h)
			In daytime	At night	
Noise (construction noise and environmental noise)	2	2	8: 00~12: 00	22: 00~24: 00	20min
TSP	2	1	8: 00-20: 00		12
CO	2	1	8: 00-02: 00		18
Surface water	2	1	—		—

3. Technical Basis and Monitoring Instruments

Technical basis and monitoring instruments are listed in table 4.

Table 4 Technical Basis and Monitoring Instruments and Equipment

No.	Monitoring items	Monitoring Basis		Instruments and Equipment	
		Sources of monitoring methods	Detection Limit mg/m ³	Name, model/specification	Management NO.
1	Noise	<i>Standard of Ambient Air Quality</i> (National Standard GB3096-2008)	—	HS6288 Multi-function noise analyzer	JHZX-YQ-024~25
2	TSP	Gravimetry (National Standard GB/T15432-1995)	0.001	TSP intelligent sampling tank	JHZX-YQ-013~16
3	CO	Non-dispersive infrared analysis method GB9801-88	0.3	GXH-3011A1	JHZX-YQ-058
4	pH value	Glass electrode method (GB6920-86)	0.02pH	Thermo Orion868 pH measurement device	JHZX-YQ-022
5	SS	Gravimetric method (GB11901-89)	4 mg/L	BS210S electronic balance	JHZX-YQ-037
6	COD	Potassium Dichromate Method (GB11914-89)	5 mg/L	Buret	
7	DO	Analyzing Method of Electro Chemical Probe Determination GB11913-1989	0.2	DO110 Portable DO meter	JHZX-YQ-065
8	Petroleum	Infrared spectrophoto (GB/T16488-1996)	0.01mg/L	OIL420 Infrared oil meter	JHZX-YQ-021
9	NH3-N	Nessler's reagent spectrophotometry(GB7479-87)	0.025mg/L	UV-1800 UV-Vis	JHZX-YQ-064

4. Monitoring Basis and Assessment Standard

4.1 Monitoring Basis

- 1) *Environmental Impact Assessment on Longlin – Baise Express Highway*
- 2) *Technical Service Contract for Environmental Monitoring of Longlin – Baise Express Highway during Construction Period*

- 3) *Monitoring and Analysis Methods for Air and Waste Air (4th edition)*
- 4) *Technical Specification for Environmental Monitoring (Volume III)*
- 5) *Corpus of Environmental Protection Standards*

4.2 Assessment Standards

Table 5 Assessment Standards

Assessment Items	Assessment Standards
pH value, COD, DO, NH ₃ -N, SS and petroleum	<i>Standard of Surface Water Resource Quality (National Standard GB3838-2002), Standard of Surface Water Resource Quality (SL 63-94) is applicable for SS</i>
Noise	<i>Standard of Acoustic Environment of Urban Area (National Standard GB3096-2008)</i>
TSP、CO	<i>Standard of Ambient Air Quality (National Standard GB3095-1996)</i>

Grade II standards of *Standard of Surface Water Resource Quality* (National Standard GB3838-2002) was applicable for monitoring section at Chengbi River Reservoir Bridge while grade III was for Tangxing Reservoir Bridge. Please find table 6 for details

Table 6 Applicable Standards for Surface Water Environment

Pollutants

Items	Grade II (mg/L, but not for pH value)	Grade II I (mg/L, but not for pH value)
pH value	6~9	6~9
SS	25	30
DO	6	5
COD	4	6
NH ₃ -N	0.5	1.0
Petroleum	0.05	0.05

Corresponding standards in *Standard of Acoustic Environment of Urban Area* (National Standard GB3096-93) are adopted. Table 7 shows the details.

Table 7 Applicable Standards for Ambient Air Quality

Unit: Equivalent Continuous A Sound Leq [dB(A)]

Grade	In daytime	At night	Applicable Scope
2	60	50	Areas and schools beyond

			30m to the boundary line of planned highway
4	70	55	Area within 30m to the boundary line of planned highway

Grade II standards of Standard of Ambient Air Quality (National Standard GB3095-1996) are applicable for the ambient air around the highway. Please find table 8 for details.

Table 8 Applicable Standards for Ambient Air

Name of pollutants	Sampling time	Concentration detention limits for grade II	Unit of concentration
TSP	Daily average	0.30	mg/m ³
CO		4.0	

Relevant detention limits in *Integrated Discharge Standard for Atmospheric Pollutants* (National Standard GB16297-1996) is adopted for concrete mixing system. Please find table 9 for details

Table 9 Integrated Discharge Standard for Atmospheric Pollutants

Pollutants	Monitoring concentration threshold of fugitive emission.	
	Monitoring point	Concentration (mg/m ³)
Particulates	The point with the highest concentration	1.0

5. Analysis Methods and Quality Control Measures

In order to ensure representativeness, accuracy and comparability of the monitoring data, strict quality control measures were taken in the whole process of the environmental monitoring. Monitoring devices were checked and identified to be acceptable by metrological service department, and also adjusted according to relevant regulations before being used. 100 % of the operators undertaking the monitoring and analysis tasks were qualified with working certification issued by National Environmental Monitoring Center.

6. Monitoring Result

Please refer to table 10-1~7, table 11-1~7 and table 12-1~7 for details.

Table 10-1 Noise Monitoring Results of Residential Areas in Jul. 2009

Unit: dB(A)

No.	Locations of monitoring points	Jul. 22		Jul. 23	
		In daytime	At night	In daytime	At night

1 [#]	Lawei Village	$L_{eq}=59.3$	No construction	$L_{eq}=59.0$	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
2 [#]	Weile Primary School	$L_{eq}=56.2$	No construction	$L_{eq}=57.1$	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
3 [#]	Muchang Primary School	$L_{eq}=58.3$	No construction	$L_{eq}=58.6$	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
4 [#]	Jiuzhou Town	$L_{eq}=64.6$	No construction	$L_{eq}=66.3$	No construction
		Excavation, ground leveling, sludge		Excavation, ground leveling,	
5 [#]	Pingji Village	$L_{eq}=63.6$	No construction	$L_{eq}=67.7$	No construction
		Ground leveling, sludge conveyance		Excavation, ground leveling,	
6 [#]	Hongqi Village	$L_{eq}=61.2$	No construction	$L_{eq}=62.1$	No construction
		Excavation, ground leveling, sludge		Ground leveling, sludge conveyance	
7 [#]	Xinning Village	$L_{eq}=58.1$	No construction	$L_{eq}=60.1$	No construction
		Excavation, ground leveling, sludge		Excavation, ground leveling,	
8 [#]	Changzhai Village	$L_{eq}=63.4$	No construction	$L_{eq}=63.5$	No construction
		Ground leveling, sludge conveyance		Excavation, ground leveling,	

Table 10-2 Noise Monitoring Results of Residential Areas in Aug. 2009

Unit: dB(A)

No.	Locations of monitoring points	Aug. 19		Aug. 20	
		In daytime	At night	In daytime	At night
1 [#]	Zhenian Village	$L_{eq}=56.1$	No construction	$L_{eq}=57.4$	$L_{eq}=53.5$
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	Excavation
2 [#]	Pingman Primary School	$L_{eq}=54.7$	No construction	$L_{eq}=52.1$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
3 [#]	Zheshu Village	$L_{eq}=61.7$	No construction	$L_{eq}=54.5$	No construction

		Ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
4 [#]	Lucheng Junior Middle School	$L_{eq}=52.8$	No construction	$L_{eq}=51.1$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
5 [#]	Yanzhan Village	$L_{eq}=61.9$	No construction	$L_{eq}=57.5$	No construction
		Ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
6 [#]	Liangba Village	$L_{eq}=58.7$	No construction	$L_{eq}=60.9$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
7 [#]	Nami	$L_{eq}=55.5$	No construction	$L_{eq}=55.1$	No construction
		Ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
8 [#]	Nade Village	$L_{eq}=58.2$	No construction	$L_{eq}=56.8$	No construction
		Ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	

Table 10-3 Noise Monitoring Results of Residential Areas in Sep. 2009

Unit: dB(A)

No.	Locations of monitoring points	Sep. 28		Sep. 29	
		In daytime	At night	In daytime	At night
1 [#]	Shitoulin Village	$L_{eq}=55.6$	No construction	$L_{eq}=57.2$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
2 [#]	Nashe Village	$L_{eq}=56.9$	No construction	$L_{eq}=57.6$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
3 [#]	Lucheng Town	$L_{eq}=60.5$	No construction	$L_{eq}=61.3$	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
4 [#]	Hekou Village	$L_{eq}=52.2$	No construction	$L_{eq}=50.8$	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	

5 [#]	Pingwang Village	$L_{eq}=60.4$	No construction	$L_{eq}=59.2$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
6 [#]	Liangba Village	$L_{eq}=55.1$	No construction	$L_{eq}=56.7$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
7 [#]	Nami	$L_{eq}=58.6$	No construction	$L_{eq}=57.0$	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
8 [#]	Wanyu Village	$L_{eq}=59.1$	No construction	$L_{eq}=56.8$	No construction
		Excavation, ground leveling, sludge conveyance		ground leveling, sludge conveyance	

Table 10-4 Noise Monitoring Results of Residential Areas in Oct. 2009

Unit: dB(A)

No.	Locations of monitoring points	Oct. 12		Oct. 13	
		In daytime	At night	In daytime	At night
1 [#]	Bangba Village	$L_{eq}=55.1$	No construction	$L_{eq}=61.8$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
2 [#]	Weile Village	$L_{eq}=62.1$	No construction	$L_{eq}=63.9$	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
3 [#]	Hope Primary School in Zhenian	$L_{eq}=58.3$	No construction	$L_{eq}=58.7$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
4 [#]	Pingman Village	$L_{eq}=59.4$	No construction	$L_{eq}=60.3$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
5 [#]	Xinning Village	$L_{eq}=56.8$	No construction	$L_{eq}=59.5$	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
6 [#]	Yanka Village	$L_{eq}=60.5$	No construction	$L_{eq}=62.5$	No construction
		Excavation, ground leveling, sludge		Excavation, ground leveling,	

		conveyance		sludge conveyance	
7 [#]	Nalai Village	$L_{eq}=55.3$	No construction	$L_{eq}=58.9$	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
8 [#]	Nanka Village	$L_{eq}=54.6$	No construction	$L_{eq}=52.1$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	

Table 10-5 Noise Monitoring Results of Residential Areas in Nov. 2009

Unit: dB(A)

No.	Locations of monitoring points	Nov. 11		Nov. 12	
		In daytime	At night	In daytime	At night
1 [#]	Lawei Village K5+200	$L_{eq}=55.2$	No construction	$L_{eq}=55.6$	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
2 [#]	Weile Primary School K6+300	$L_{eq}=53.9$	No construction	$L_{eq}=54.4$	No construction
		Ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
3 [#]	Muchang Primary School K22+380	$L_{eq}=55.4$	No construction	$L_{eq}=56.9$	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
4 [#]	Pingman Village K44+300	$L_{eq}=57.3$	No construction	$L_{eq}=56.8$	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
5 [#]	Bantaou Village K62+120	$L_{eq}=57.1$	No construction	$L_{eq}=58.1$	$L_{eq}=56.4$
		Ground leveling, sludge conveyance	No construction	Excavation, ground leveling, sludge conveyance	Excavation
6 [#]	Nashe Village K65+800	$L_{eq}=58.3$	No construction	$L_{eq}=57.8$	$L_{eq}=50.8$
		Excavation, ground	No construction	Ground leveling, sludge	Excavation

		leveling, sludge conveyance		conveyance	
7 [#]	Pingji Village K76+000	L _{eq} =55.5	No construction	L _{eq} =54.0	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
8 [#]	Lucheng Primary School K78+900	L _{eq} =59.4	No construction	L _{eq} =58.8	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	

Table 10-6 Noise Monitoring Results of Residential Areas in Dec. 2009

Unit: dB(A)

No.	Locations of monitoring points	Dec. 20		Dec. 21	
		In daytime	At night	In daytime	At night
1 [#]	Nashe Village K65+800	56.3	No construction	55.9	No construction
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
2 [#]	Hongqi Village K87+ 800	55.5	49.6	56.2	50.1
		Excavation, ground leveling, sludge conveyance		Excavation, ground leveling, sludge conveyance	
3 [#]	Yanzhan Village K90+600	56.7	50.1	56.2	49.8
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
4 [#]	Pingwang Village K108+300	57.3	No construction	58.0	No construction
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
5 [#]	Xianke Primary School in Liangba K126+450	54.4	50.8	54.7	51.1
		Excavation, ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
6 [#]	Nami K128+800	58.4	No construction	58.0	No construction
		Ground leveling,		Excavation,	

		sludge conveyance		ground leveling, sludge conveyance	
7#	Wanyu Village K149+500	55.9	No construction	56.3	No construction
		Ground leveling, sludge conveyance		Ground leveling, sludge conveyance	
8#	Xinzhai Village LK15+200	54.1	No construction	54.4	No construction

Table 11-1 Ambient Air Quality Monitoring Results in Jul. 2009

Units: mg/m³

location of points		date		item	date	
					Jul. 22	Jul. 23
Weile Primary School	TSP	Average daily		0.219	0.238	
	CO		1.1	0.9		
No. 14 mixing station	TSP		0.789	0.778		
	CO		1.2	1.3		
Pingji Village	TSP		0.198	0.166		
	CO		0.9	1.1		
Xinning Village	TSP		0.198	0.224		
	CO		1.2	0.9		

Table 11-2 Ambient Air Quality Monitoring Results in Aug. 2009

Units: mg/m³

location		date		item	date	
					Aug. 19	Aug. 20
Pingman Primary School	TSP	Average daily		0.265	0.249	
	CO		1.1	1.2		
No. 12 mixing station	TSP		0.874	0.906		
	CO		1.2	0.9		
Yanzhan Village	TSP		0.265	0.266		
	CO		1.1	1.1		
Nami	TSP		0.217	0.232		
	CO		1.2	0.8		

Table 11-3 Ambient Air Quality Monitoring Results in Sep. 2009

Units: mg/m³

location of points		item	date	
			Sep. 28	Sep. 29
Shitoulin Village	TSP	Average daily	0.218	0.192
	CO		1.2	0.9
Lucheng Town	TSP		0.177	0.212
	CO		1.2	1.1
Pingwang Village	TSP		0.227	0.248
	CO		1.1	1.1
No. 2 mixing station	TSP		1.114	0.926
	CO		1.2	0.9

Table 11-4 Ambient Air Quality Monitoring Results in Oct. 2009

Units: mg/m³

location of points		item	date	
			Oct. 12	Oct. 13
Weile Village	TSP	Average daily	0.158	0.173
	CO		1.2	1.1
Pingman Village	TSP		0.277	0.246
	CO		1.0	0.8
Nalai Village	TSP		0.211	0.178
	CO		1.4	1.2
No. 9 mixing station	TSP		0.854	0.988
	CO		1.2	1.1

Table 11-5 Ambient Air Quality Monitoring Results in Nov. 2009

Units: mg/m³

location of points		date		Nov. 11	Nov. 12
Lawei Village K5+200	TSP	Average daily	0.220	0.195	
	CO		1.3	1.5	
Pingman Village K44+300	TSP		0.206	0.227	
	CO		0.9	1.0	
Bantou Village K62+120	TSP		0.211	0.208	
	CO		0.8	0.9	
Lucheng Junior Middle School K78+900	TSP		0.287	0.259	
	CO		1.1	1.3	

Table 11-6 Ambient Air Quality Monitoring Results in Dec. 2009

Units: mg/m³

location of points		date		Dec. 20	Dec. 21
Nashe Village K65+800	TSP	Average daily	0.250	0.215	
	CO		1.1	1.3	
Yanzhan Village K90+600	TSP		0.246	0.277	
	CO		1.3	1.0	
Xianke Primary School in Liangba Village K126+450	TSP		0.211	0.228	
	CO		1.2	0.9	
Wanyu Village K149+500	TSP		0.187	0.159	
	CO		1.0	1.1	

Table 12-1 Surface Water Environmental Quality Monitoring Results in Jul. 2009

Units: mg/L

Secions	Item			PH	COD _{Mn}	Petroleum	SS	DO	NH3-N
	Results		Dates						
500m to the left of Chengbi River Reservoir Bridge	0.5m to river surface	Jul 22	Left	7.88	1.8	0.01L	17	6.7	0.187
			Right	7.85	1.7	0.01L	15	6.9	0.175
		Jul 23	Left	7.86	1.9	0.01L	16	7.0	0.183
			Right	7.81	1.7	0.01L	14	7.1	0.172
	0.5m to river bottom	Jul 22	Left	7.89	1.6	0.01L	17	7.0	0.167
			Right	7.87	2.0	0.01L	16	7.2	0.176
		Jul 23	Left	7.88	1.6	0.01L	19	7.3	0.185
			Right	7.89	1.9	0.01L	17	7.1	0.197
500m to the right of Chengbi River Reservoir Bridge	0.5m to river surface	Jul 22	Left	7.85	1.8	0.01L	14	7.2	0.188
			Right	7.87	2.0	0.01L	15	7.5	0.170
		Jul 23	Left	7.86	1.8	0.01L	16	6.9	0.182
			Right	7.89	1.7	0.01L	19	7.4	0.168
	0.5m to river bottom	Jul 22	Left	7.88	1.6	0.01L	17	7.2	0.173
			Right	7.87	1.8	0.01L	19	7.5	0.175
		Jul 23	Left	7.88	1.7	0.01L	16	7.2	0.198
			Right	7.86	1.6	0.01L	19	7.1	0.181
500m to the left of Tangxing Reservoir Bridge	0.5m to river surface	Jul 22	Left	7.97	2.3	0.01L	25	6.3	0.213
			Right	7.98	2.7	0.01L	23	6.0	0.283
		Jul 23	Left	7.99	2.4	0.01L	24	6.2	0.284
			Right	8.00	2.5	0.01L	20	6.4	0.218
500m to the left of Tangxing Reservoir Bridge	0.5m to river bottom	Jul 22	Left	8.00	2.0	0.01L	21	6.2	0.198
			Right	8.01	2.5	0.01L	25	6.1	0.203
		Jul 23	Left	8.02	2.5	0.01L	24	6.2	0.243

			Right	8.04	2.1	0.01L	19	6.4	0.264
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Table 12-2 Surface Water Environmental Quality Monitoring Results in Aug.

2009

Units: mg/L

Secions		Item		PH	COD _{Mn}	Petroleum	SS	DO	NH3-N
		Results							
		Dates							
500m to the left of Chengbi River Reservoir Bridge	0.5m to river surface	Aug 19	Left	7.89	2.0	0.01L	19	7.2	0.187
			Right	7.87	1.6	0.01L	18	7.1	0.192
		Aug 20	Left	7.86	1.8	0.01L	16	7.3	0.170
			Right	7.88	1.7	0.01L	16	7.1	0.167
	0.5m to river bottom	Aug 19	Left	7.89	1.8	0.01L	17	7.5	0.184
			Right	7.89	2.0	0.01L	17	7.2	0.172
		Aug 20	Left	7.91	1.4	0.01L	19	7.3	0.188
			Right	7.86	1.6	0.01L	18	7.4	0.173
500m to the right of Chengbi River Reservoir Bridge	0.5m to river surface	Aug 19	Left	7.88	1.8	0.01L	18	7.1	0.215
			Right	7.89	1.7	0.01L	15	7.5	0.195
		Aug 20	Left	7.88	1.8	0.01L	14	7.3	0.179
			Right	7.91	1.7	0.01L	19	7.4	0.186
	0.5m to river bottom	Aug 19	Left	7.90	1.9	0.01L	16	7.2	0.167
			Right	7.87	2.0	0.01L	19	7.5	0.172
		Aug 20	Left	7.89	1.9	0.01L	18	7.2	0.182
			Right	7.87	1.5	0.01L	20	7.5	0.174
500m to the left of Tangxing Reservoir Bridge	0.5m to river surface	Aug 19	Left	8.01	2.8	0.01L	26	6.3	0.238
			Right	8.02	2.2	0.01L	27	6.5	0.247
		Aug 20	Left	8.03	2.5	0.01L	24	6.6	0.265
			Right	8.00	2.6	0.01L	25	6.4	0.258
500m to the left of Tangxing Reservoir Bridge	0.5m to river	Aug 19	Left	8.02	2.7	0.01L	26	6.2	0.228
			Right	8.01	2.5	0.01L	25	6.6	0.253
	bottom	Aug 20	Left	8.02	2.7	0.01L	24	6.5	0.246

			Right	8.02	2.8	0.01L	22	6.4	0.267
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Table 12-3 Surface Water Environmental Quality Monitoring Results in Sep.

2009

Units: mg/L

Secions	Item	Results	Dates		PH	COD _{Mn}	Petroleum	SS	DO	NH3-N
500m to the left of Chengbi River Reservoir Bridge	0.5m to river surface	Sep. 28	Left		7.65	2.0	0.01L	13	7.5	0.207
			Right		7.63	2.0	0.01L	15	7.4	0.198
		Sep. 29	Left		7.67	1.8	0.01L	15	7.3	0.175
			Right		7.66	1.7	0.01L	18	7.6	0.187
	0.5m to river bottom	Sep. 28	Left		7.65	1.3	0.01L	11	7.5	0.214
			Right		7.68	2.1	0.01L	14	7.4	0.202
		Sep. 29	Left		7.67	1.4	0.01L	13	7.3	0.208
			Right		7.66	1.7	0.01L	18	7.4	0.197
500m to the right of Chengbi River Reservoir Bridge	0.5m to river surface	Sep. 28	Left		7.66	1.7	0.01L	15	7.5	0.228
			Right		7.68	1.8	0.01L	15	7.5	0.215
		Sep. 29	Left		7.65	1.5	0.01L	18	7.7	0.187
			Right		7.61	1.6	0.01L	14	7.4	0.186
	0.5m to river bottom	Sep. 28	Left		7.64	1.7	0.01L	14	7.5	0.187
			Right		7.67	2.0	0.01L	12	7.5	0.182
		Sep. 29	Left		7.63	1.6	0.01L	13	7.6	0.228
			Right		7.64	1.8	0.01L	16	7.5	0.258
500m to the left of Tangxing Reservoir Bridge	0.5m to river surface	Sep. 28	Left		7.81	2.3	0.01L	21	6.8	0.238
			Right		7.84	2.2	0.01L	22	6.5	0.287
		Sep. 29	Left		7.82	2.4	0.01L	18	6.6	0.278
			Right		7.85	2.2	0.01L	25	6.7	0.284
500m to the left of Tangxing Reservoir Bridge	0.5m to river bottom	Sep. 28	Left		7.85	2.1	0.01L	20	6.8	0.267
			Right		7.83	2.4	0.01L	20	6.6	0.243
		Sep. 29	Left		7.83	1.8	0.01L	21	6.8	0.246
			Right		7.84	2.0	0.01L	22	6.6	0.257

Table 12-4 Surface Water Environmental Quality Monitoring Results in Oct. 2009

Units: mg/L

Secions	Item		Results	PH	COD _{Mn}	Petroleum	SS	DO	NH3-N
	Dates								
500m to the left of Chengbi River Reservoir Bridge	0.5m to river surface	Oct 12	Left	7.69	1.4	0.01L	14	7.7	0.178
			Right	7.68	1.6	0.01L	16	7.5	0.228
	0.5m to river surface	Oct 13	Left	7.71	1.4	0.01L	14	7.6	0.178
			Right	7.70	1.8	0.01L	13	7.3	0.168
	0.5m to river bottom	Oct 12	Left	7.68	1.6	0.01L	15	7.4	0.218
			Right	7.67	1.5	0.01L	16	7.4	0.252
0.5m to river bottom	Oct 13	Left	7.69	1.4	0.01L	17	7.7	0.258	
		Right	7.72	1.1	0.01L	18	7.5	0.187	
500m to the right of Chengbi River Reservoir Bridge	0.5m to river surface	Oct 12	Left	7.70	1.2	0.01L	14	7.6	0.242
			Right	7.69	1.3	0.01L	16	7.7	0.225
	0.5m to river surface	Oct 13	Left	7.69	1.5	0.01L	18	7.7	0.184
			Right	7.68	1.3	0.01L	18	7.5	0.180
	0.5m to river bottom	Oct 12	Left	7.69	1.2	0.01L	15	7.5	0.194
			Right	7.71	1.0	0.01L	14	7.5	0.197
0.5m to river bottom	Oct 13	Left	7.67	1.5	0.01L	18	7.4	0.208	
		Right	7.69	1.4	0.01L	16	7.5	0.218	
500m to the left of Tangxing Reservoir Bridge	0.5m to river surface	Oct 12	Left	7.86	2.4	0.01L	23	6.5	0.308
			Right	7.84	2.5	0.01L	25	6.5	0.282
	0.5m to river surface	Oct 13	Left	7.87	1.8	0.01L	21	6.5	0.267
			Right	7.87	2.4	0.01L	24	6.3	0.259
500m to the left of Tangxing Reservoir Bridge	0.5m to river bottom	Oct 12	Left	7.88	2.3	0.01L	25	6.0	0.267
			Right	7.85	2.4	0.01L	25	6.2	0.273
	0.5m to river bottom	Oct 13	Left	7.84	2.6	0.01L	26	6.3	0.256
			Right	7.88	2.1	0.01L	22	6.4	0.265

Table 12-5 Surface Water Environmental Quality Monitoring Results in Nov.

2009

Units: mg/L

Secions		Item		PH	COD _{Mn}	Petroleum	SS	DO	NH3-N
		Results	Dates						
500m to the left of Chengbi River Reservoir Bridge	0.5m to river surface	Nov. 11	Left	7.83	2.6	0.01L	21	6.3	0.162
			Right	7.88	2.5	0.01L	18	6.2	0.160
		Nov. 12	Left	7.91	2.5	0.01L	19	6.5	0.165
			Right	8.02	2.5	0.01L	22	6.4	0.161
	0.5m to river bottom	Nov. 11	Left	7.87	2.7	0.01L	20	6.4	0.170
			Right	7.90	2.7	0.01L	20	6.2	0.167
		Nov. 12	Left	7.88	2.6	0.01L	18	6.3	0.169
			Right	7.94	2.5	0.01L	19	6.1	0.165
500m to the right of Chengbi River Reservoir Bridge	0.5m to river surface	Nov. 11	Left	8.03	2.2	0.01L	18	6.4	0.168
			Right	7.98	2.3	0.01L	19	6.2	0.166
		Nov. 12	Left	7.95	2.2	0.01L	20	6.3	0.172
			Right	7.90	2.5	0.01L	20	6.1	0.168
	0.5m to river bottom	Nov. 11	Left	7.87	2.3	0.01L	22	6.3	0.173
			Right	7.96	2.5	0.01L	19	6.5	0.170
		Nov. 12	Left	8.05	2.7	0.01L	19	6.5	0.175
			Right	7.96	2.6	0.01L	21	6.2	0.170
500m to the left of Tangxing Reservoir Bridge	0.5m to river surface	Nov. 11	Left	8.01	1.9	0.01L	22	5.7	0.181
			Right	8.03	1.7	0.01L	23	5.3	0.174
		Nov. 12	Left	8.05	1.8	0.01L	20	5.5	0.184
			Right	8.04	1.5	0.01L	22	5.1	0.180
500m to the left of Tangxing Reservoir Bridge	0.5m to river bottom	Nov. 11	Left	8.00	2.0	0.01L	21	5.6	0.176
			Right	8.01	1.8	0.01L	20	5.4	0.170
		Nov. 12	Left	8.09	1.9	0.01L	19	5.7	0.193
			Right	8.05	2.0	0.01L	19	5.2	0.188

Table 12-6 Surface Water Environmental Quality Monitoring Results in Dec.

2009

Units: mg/L

Secions		Item		PH	COD _{Mn}	Petroleum	SS	DO	NH3-N
		Results	Dates						

500m to the left of Chengbi River Reservoir Bridge	0.5m to river surface	Dec. 20	Left	8.07	2.2	0.01L	23	5.6	0.154
			Right	8.08	2.3	0.01L	20	5.6	0.150
		Dec. 21	Left	8.11	2.4	0.01L	20	5.5	0.163
			Right	8.12	2.4	0.01L	23	5.4	0.158
	0.5m to river bottom	Dec. 20	Left	7.96	2.3	0.01L	21	5.3	0.166
			Right	7.94	2.2	0.01L	21	5.4	0.161
		Dec. 21	Left	7.98	2.4	0.01L	20	5.5	0.159
			Right	7.99	2.6	0.01L	20	5.3	0.164
500m to the right of Chengbi River Reservoir Bridge	0.5m to river surface	Dec. 20	Left	7.83	2.3	0.01L	20	5.2	0.177
			Right	7.88	2.5	0.01L	19	5.5	0.169
		Dec. 21	Left	7.90	2.5	0.01L	22	5.4	0.162
			Right	7.93	2.5	0.01L	21	5.2	0.166
	0.5m to river bottom	Dec. 20	Left	7.95	2.4	0.01L	23	5.4	0.170
			Right	7.94	2.2	0.01L	20	5.3	0.175
		Dec. 21	Left	8.15	2.1	0.01L	22	5.5	0.173
			Right	8.17	2.4	0.01L	23	5.5	0.167
500m to the left of Tangxing Reservoir Bridge	0.5m to river surface	Dec. 20	Left	7.92	1.8	0.01L	22	5.6	0.192
			Right	7.93	1.6	0.01L	22	5.4	0.184
		Dec. 21	Left	8.15	1.9	0.01L	20	5.7	0.194
			Right	8.14	1.7	0.01L	23	5.4	0.186
500m to the left of Tangxing Reservoir Bridge	0.5m to river bottom	Dec. 20	Left	8.17	1.7	0.01L	23	5.2	0.183
			Right	8.19	1.6	0.01L	24	5.3	0.175
		Dec. 21	Left	8.09	1.9	0.01L	22	5.4	0.188
			Right	8.13	1.7	0.01L	20	5.5	0.178

7. Environmental Protection Measures Taken on Each Contract Section to Mitigate Environment Impact during Construction Period.

Through field survey, it is found that corresponding measures have been taken to mitigate major environmental impacts on each contract section during the first half of the year. Please find table 13-1~15 for details.

Table 13-1 Implementation of Environmental Management (NO. 1-2 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on surface water quality	Slurry generated in drilling and pier construction	Yes: ✓	No:	Effect is fairly good since no impact has been brought to residential in Shali Village	Nov. ~ Dec. 2008	K17+010 K17+910	No1-2
	Recycling utilization of slurry	Yes: ✓	No:				
	Oil leakage of equipment and ships	Yes:	No:				
	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Effect is fairly good since no impact has been brought to residential in Shali Village	Mar. 2009 ~ Feb. 2010	K14+500. K16+200 K17+300
Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes:	No: ✓	Effect is fairly good since no impact has been brought to residential in adjacent of construction sites	Jun. 2008 ~ Jun. 2010	K12+750, K13+980 K20+650	No1-2

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No:	Effect is fairly good since no impact has been brought to residential in Shaili Village	Jun. 2008 ~ Jun. 2010	K12+750, K13+980, K14+850, K15+900, K17+410, K20+650	№1-2
Impacts of transport route	Optimizing alignment	Yes: ✓	No:				№1-2
Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:			K13+980	№1-2
Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No:				№1-2
Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	No impacts have been brought to surrounding residents			№1-2
Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	No impacts have been brought to surrounding residents	Aug. 2008 ~ Dec. 2009	K12+750, K13+980, K14+850, K15+900, K18+980, K20+650	№1-2
Impacts on ambient air	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	No impacts have been brought to surrounding residents	2009年6月~2009年12月	K12+780, K13+980, K14+200, K14+800, K16+200, K17+420, K19+200, K20+500	№1-2

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes:	No:				
Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes:	No:				No1-2
	Water spraying	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009		No1-2
	Covering with water-proofing clothes	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009		No1-2
	Reducing the speed	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009		No1-2
Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:	Effect is fairly good since no impact has been brought to residential in Shali Village	Jun. 2009 ~ Dec. 2009	K17-010 K17-910	No1-2
	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes:	No:				
	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Effect is fairly good since no impact has been brought to residential in Shali Village	Mar. 2009 to Feb. 2010	K14-500, K16-200 K17-300	No1-2
Impacts of emergency accidents	Working out leakage prevention scheme for emergency accidents	Yes: ✓	No:				No1-2
	Prohibiting setting of campsites at the road section	Yes:	No:				

Impact on Chengbi Lake Nature Reserve

Table 13-2 Implementation of Environmental Management (NO. 2-1 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No:					
Impacts on surface water quality	Slurry generated in drilling and pier construction	Yes: ✓	No:	fairly good	Jun. 2009 ~ Dec. 2009	K22+800`K24+000 Munchang Sandaobe K31+000`K32+400Banjian Village	NO. 2-1	
	Oil leakage of equipment and ships	Yes:	No:		Jun. 2009 ~ Dec. 2009	No		
	Waste water discharged from bridge construction sites (prefabrication site)	Yes: ✓	No:	Good	Jun. 2009 ~ Dec. 2009	Left of hollow-core slab prefabrication site	NO. 2-1	
	Wastewater containing sediments and pollutants generated during tunnel construction	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K24+900`K25+700 Longtian Tunnel	NO. 2-1	
	Domestic wastewater discharged from construction campsites	Yes: ✓	No:	Very good	Jun. 2009 ~ Dec. 2009	Left of hollow-core slab prefabrication site	NO. 2-1	
	Impacts of transport route	Optimizing alignment	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	Left of hollow-core slab prefabrication site	NO. 2-1
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009		NO. 2-1
		Recycling utilization of slurry	Yes: ✓	No:				
		Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
		Checking the maintenance of construction equipment	Yes:	No:				
	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:					
	Setting SS separation system	Yes: ✓	No:					
	Treating with tertiary septic tanks	Yes: ✓	No:					

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No: ✗					
Impacts on ambient air	Impacts of concrete mixing stations to sensitive points	Yes: ✓	No: ✗	Good	Jun. 2009 ~ Dec. 2009	K42+300 mixing station	NO. 2-1	
	Impacts of construction at night to sensitive points	Yes: ✓	No: ✗	Good	Jun. 2009 ~ Dec. 2009		NO. 2-1	
	Impacts of blasting	Yes: ✓	No: ✗	Good	Jun. 2009 ~ Dec. 2009	K22+800~K24+000 Muchang Sandaohe K31+000~K32+400Banjian Village	NO. 2-1	
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Yes: ✓	No: ✗	Very good	Jun. 2009 ~ Dec. 2009	Left of K32+500 mixing station	NO. 2-1	
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Yes: ✓	No: ✗		Jun. 2009 ~ Dec. 2009			
	Impacts of transport routes near sensitive points to those points	Yes: ✓	No: ✗	Very good	Jun. 2009 ~ Dec. 2009	The whole route	NO. 2-1	
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No: ✗	fairly good	Jun. 2009 ~ Dec. 2009	The whole route	NO. 2-1
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No: ✗	Very good	Jun. 2009 ~ Dec. 2009	The whole route	NO. 2-1

Table 13-3 Implementation of Environmental Management (NO. 2-2 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on surface water quality	Slurry generated in drilling and pier construction	Yes: ✓	No:	Very good	Jun. 2009 - Dec. 2009	Shitoulin Reservoir K47+160 1# bridge, K47+535 2# bridge, K47+885 3# bridge	NO. 2-2
	Oil leakage of equipment and ships	Yes: ✓	No:	Fairly good	Jun. 2009 - Dec. 2009	K47+160 1# bridge in reservoir	NO. 2-2
	Waste water discharged from bridge construction sites (prefabrication site)	Yes: ✓	No:	Good	Jun. 2009 - Dec. 2009	K39+700 Jiuzhou Prefabricated site	NO. 2-2
	Wastewater containing sediments and pollutants generated during tunnel construction	Yes:	No:		Jun. 2009 - Dec. 2009		NO. 2-2
Noise impact	Domestic wastewater discharged from construction campsites	Yes: ✓	No:	Very good	Jun. 2009 - Dec. 2009	K39+145 1# bridge of Jiuzhou	NO. 2-2
	Impacts of transport route	Yes: ✓	No:	Fairly good	Jun. 2009 - Dec. 2009	K42+300 mixing station	NO. 2-2
	Impacts of construction near sensitive points	Yes: ✓	No:	Fairly good	Jun. 2009 - Dec. 2009	K43+240 Pingman Primary School	NO. 2-2

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on ambient air	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No:	Good	K42+300 搅拌站	NO. 2-2
	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22:00 to 06:00 is prohibited.	Yes: ✓	No:	Good	K44+000~K44+300 K48+500~K44+800	NO. 2-2
	Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	Good	K39+320~K39+500 K44+700~K44+910	NO. 2-2
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	Very good	K42+300 station	NO. 2-2
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes:	No:			
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Very good	K42+887access road K39+145access road	NO. 2-2
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No:	Fairly good	K35+117~K46+500	NO. 2-2
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Very good	K35+117~K46+500	NO. 2-2

Table 13-4 Implementation of Environmental Management (NO. 3-1 Contract Section)

Environmental impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on surface water quality	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Oil leakage of equipment and ships	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
		Checking the maintenance of construction equipment	Yes: ✓	No:			
Impacts on surface water quality	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
		Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320
Noise impact	Impacts of transport route	Optimizing alignment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on ambient air	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K52+000-K62+320	No. 3-1
	Impact of high-speed transport	Reducing the speed			Jun. 2009 ~ Dec. 2009		

Table 13-5 Implementation of Environmental Management (NO. 3-2 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No:					
Impacts on surface water quality	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	AK0+735 K68+001	No. 3-2	
	Oil leakage of equipment and ships	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009			
	Waste water discharged from bridge construction sites (prefabrication site)	Checking the maintenance of construction equipment	Yes:	No:	Jun. 2009 ~ Dec. 2009			
	Wastewater containing sediments and pollutants generated during tunnel construction	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K68+400	No. 3-2	
	Domestic wastewater discharged from construction campsites	Setting SS separation system	Yes:	No:	Jun. 2009 ~ Dec. 2009			
	Impacts of transport route	Treating with tertiary septic tanks	Yes:	No: ✓	Jun. 2009 ~ Dec. 2009			
	Impacts of construction near sensitive points	Optimizing alignment	Yes:	No:	Jun. 2009 ~ Dec. 2009			
	Noise impact	Impacts of concrete mixing stations to sensitive points	Utilizing low-noise-level equipment	Yes:	No: ✓	Jun. 2009 ~ Dec. 2009		
			Locating the stations far from sensitive points	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K65+000	No. 3-2

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on ambient air	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	Reducing noise level and mitigating impact to surrounding residents	K62+320`K68+650	No. 3-2
	Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	There is no blasting accident	K62+320`K68+650	No. 3-2
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes:	No:			
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes:	No:			
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Reducing fugitive dust	K62+320`K68+650	No. 3-2
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes:	No:			
Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Reducing fugitive dust	K62+320`K68+650	No. 3-2	

Table 13-6 Implementation of Environmental Management (NO.5 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts	Slurry generated in drilling and pier	Recycling utilization of slurry	Yes: ✓	No:	良好	K93+448 及 K84+460	No5

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
on surface water quality	construction	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes:	No:		Jun. 2009 ~ Dec. 2009		
	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K94+200、K83+650	No5
	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes:	No:		Jun. 2009 ~ Dec. 2009		
	Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K94+200、K83+850	No5
	Impacts of transport route	Optimizing alignment	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K93+448	No5
Noise impact	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K94+200	No5
	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K94+200	No5
	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K93+448	No5

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on ambient air	Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	Fairly good	Blasting for subgrade and pile	No5
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	Fairly good	K94+200 and K83+850	No5
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes: ✓	No:	Fairly good	K94+200 and K83+650	No5
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Fairly good	K84+800, K86+000, K87+600, K89+000	No5
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No:	Fairly good	Entrance of construction site	No5
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Fairly good	K94+200	No5

Table 13-7 Implementation of Environmental Management (NO.6 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes:	No:				
Impacts on surface	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes:	No:	Fairly good		No construction of drilling
		Waste generated during drilling being settled in settling tanks	Yes:	No:			

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
water quality	Oil leakage of equipment and ships	Yes: ✓	No:		Jun. 2009 ` Dec. 2009		No use of ships
	Waste water discharged from bridge construction sites (prefabrication site)	Yes: ✓	No:	Avoiding pollution of sand and sludge to bridge construction site	Jun. 2009 ` Dec. 2009	K93+650~K104+800	No6
	Wastewater containing sediments and pollutants generated during tunnel construction	Yes: ✓	No:	Avoiding environment pollution in tunnel construction site	Jun. 2009 ` Dec. 2009	K93+650~K104+800	No6
	Domestic wastewater discharged from construction campsites	Yes: ✓	No:	Bringing no domestic wastewater pollution	Jun. 2009 ` Dec. 2009	K93+650~K104+800	No6
Noise impact	Impacts of transport route	Yes: ✓	No:	Without noise complaint	Jun. 2009 ` Dec. 2009	K93+650~K104+800	No6
	Impacts of construction near sensitive points	Yes: ✓	No:	Without noise complaint	Jun. 2009 ` Dec. 2009	K93+650~K104+800	No6
	Impacts of concrete mixing stations to sensitive points	Yes: ✓	No:	Without noise complaint	Jun. 2009 ` Dec. 2009	K93+650~K104+800	No6
	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	Without noise complaint	Jun. 2009 ` Dec. 2009	K93+650~K104+800

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No:					
Impacts on ambient air	Impacts of blasting	Yes: ✓	No:	Greatly reducing complaint about blasting from residents	Jun. 2009 ~ Dec. 2009	K93+650~K104+800	No.6	
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Yes: ✓	No:	Without noise complaint	Jun. 2009 ~ Dec. 2009	K93+650~K104+800	No.6	
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Yes: ✓	No:	Without noise complaint	Jun. 2009 ~ Dec. 2009	K93+650~K104+800	No.6	
	Impacts of transport routes near sensitive points to those points	Yes: ✓	No:	Without noise complaint	Jun. 2009 ~ Dec. 2009	K93+650~K104+800	No.6	
	Fugitive dust generated by transport vehicles	Yes: ✓	No:	Without noise complaint	Jun. 2009 ~ Dec. 2009	K93+650~K104+800	No.6	
	Impact of high-speed transport	Yes: ✓	No:	Without noise complaint	Jun. 2009 ~ Dec. 2009	K93+650~K104+800	No.6	
			Yes: ✓	No:				
			Yes: ✓	No:				

Table 13-8 Implementation of Environmental Management (NO.7 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impact on surface	Slurry generated in drilling and pier construction	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K105+285 1# bridge in Pingxiang, K106+000 2# bridge in Pingxiang, K107+958 railway crossing bridge, K110+640 newly-built bridge, K114+455 Pinghou Bridge	No.7
	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: <input type="checkbox"/>	No: <input type="checkbox"/>				
Water quality	Checking the maintenance of construction equipment	Yes: <input checked="" type="checkbox"/>	No: <input checked="" type="checkbox"/>	No construction of ships	Jun. 2009 ~ Dec. 2009		
	Retaining the wastewater and divert it into temporary settling tanks	Yes: <input checked="" type="checkbox"/>	No: <input type="checkbox"/>	Complying with standards	Jun. 2009 ~ Dec. 2009	No. 1 prefabrication site in Pingting (K105+000) 、 Hekou prefabrication site (K109+000) 、 tunnel construction site (K110+400) 、 Pingzhou Prefabrication site in Yunsheng (K114+000)	No.7
	Setting SS separation system	Yes: <input type="checkbox"/>	No: <input checked="" type="checkbox"/>		Jun. 2009 ~ Dec. 2009		
	Treating with tertiary septic tanks	Yes: <input checked="" type="checkbox"/>	No: <input type="checkbox"/>	Complying with standards	Jun. 2009 ~ Dec. 2009	Construction campsites	No.7
Noise impact	Optimizing alignment	Yes: <input checked="" type="checkbox"/>	No: <input type="checkbox"/>	Fairly good	Jun. 2009 ~ Dec. 2009	Access roads (K104+800 ~ K114+911.654)	No.7
	Utilizing low-noise-level equipment	Yes: <input checked="" type="checkbox"/>	No: <input type="checkbox"/>	Fairly good	Jun. 2009 ~ Dec. 2009	The whole route (K104+800 ~ K114+911.654)	No.7
	Locating the stations far from sensitive points	Yes: <input checked="" type="checkbox"/>	No: <input type="checkbox"/>	Fairly good	Jun. 2009 ~ Dec. 2009	No. 1 prefabrication site in Pingxiang (K105+000) 、 Hekou prefabrication site (K109+000) 、 tunnel construction site (K110+400) 、 Pingzhou Prefabrication site in Yunsheng (K114+000)	No.7
	Optimizing construction from period. Construction from 22:00 to 06:00 is prohibited.	Yes: <input checked="" type="checkbox"/>	No: <input type="checkbox"/>	Fairly good	Jun. 2009 ~ Dec. 2009		No.7

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No: ✗				
Impacts on ambient air	Impacts of blasting	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009		No.7
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	No. 1 prefabrication site in Pingxiang (K105+000), Hekou prefabrication site (K109+000), tunnel construction site (K110+400), Pingzhou Prefabrication site in Yunsheng (K114+000)	No.7
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Yes: ✓	No: ✗		Jun. 2009 ~ Dec. 2009		
	Impacts of transport routes near sensitive points to those points	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	The whole route (K104+800~K114+911.654)	No.7
	Fugitive dust generated by transport vehicles	Yes: ✓	No: ✗	(Complying with standards)	Jun. 2009 ~ Dec. 2009	The whole route (K104+800~K114+911.654)	No.7
	Impact of high-speed transport	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	The whole route (K104+800~K114+911.654)	No.7

Table 13-9 Implementation of Environmental Management (NO.8 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No: ✗				
Impacts on surface	Slurry generated in drilling and pier construction	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K114+700~K116+600	NO.8
		Yes: ✓	No: ✗				

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No: ✗				
water quality	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes: ✓	No: ✗	Fairly good	K122+700~ K123+700	NO. 8
	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No: ✗	Fairly good	K114+700~ K123+700	NO. 8
	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes: ✓	No: ✗	No		
	Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No: ✗	Fairly good	K114+700 K123+700	NO. 8
Noise impact	Impacts of transport route	Optimizing alignment	Yes: ✓	No: ✗	Fairly good	K114+700 K123+700	NO. 8
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No: ✗	Fairly good	K114+700 K123+700	NO. 8
	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No: ✗	Fairly good	K114+700 K123+700	NO. 8
	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22:00 to 06:00 is prohibited.	Yes: ✓	No: ✗	Fairly good	K114+700 K123+700	NO. 8
Impacts of blasting		Informing residents living within 500m to the sites in advance	Yes: ✓	No: ✗	Fairly good	K114+700 K123+700	NO. 8

Impacts on ambient air	Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
			Yes: ✓	No: ✗				
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeward direction to the residential areas nearby	Yes: ✓	No: ✗	Fairly good	Jun. 2009 - Dec. 2009	K114+700 K123+700	NO.8
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes: ✓	No: ✗	Fairly good	Jun. 2009 - Dec. 2009	K114+700 K123+700	NO.8
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No: ✗	Fairly good	Jun. 2009 - Dec. 2009	K114+700 K123+700	NO.8
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No: ✗	ok	Jun. 2009 - Dec. 2009	K114+700 K123+700	NO.8
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No: ✗	Fairly good	Jun. 2009 - Dec. 2009	K114+700~ K123+700	NO.8

Table 13-10 Implementation of Environmental Management (NO.9 Contract Section)

Impacts on surface water quality	Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
			Yes: ✓	No: ✗				
	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No: ✗	Fairly good	Jun. 2009 - Dec. 2009	K125+302 Leli River Bridge in Liangba K126+265 Liangba Reservoir Bridge	No.9
		Waste generated during drilling being settled in settling tanks	Yes: ✓	No: ✗				
	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes: ✓	No: ✗	Fairly good	Jun. 2009 - Dec. 2009	K123+700 K123+000	No.9

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No: ✗				
Noise impact	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No: ✗	Fairly good	K125+700 Prefabrication site K126+265 Liangba Reservoir Bridge	No9
	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes: ✓	No: ✗	No		
	Domestic wastewater discharged from construction campsites	Treating tertiary septic tanks with tertiary septic tanks	Yes: ✓	No: ✗	Fairly good	K123+700-K133+000	No9
	Impacts of transport route	Optimizing alignment	Yes: ✓	No: ✗	Fairly good	K125+300 Leli River Bridge in Liangba	No9
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No: ✗	Fairly good	K126+265 Liangba Reservoir Bridge	No9
	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No: ✗	Fairly good	K125+000 mixing station K127+000 mixing station	No9
	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22:00 to 06:00 is prohibited.	Yes: ✓	No: ✗	Fairly good	K126+265 Liangba Reservoir Bridge K129+000-K130+000	No9
	Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No: ✗	Fairly good	K123+700-K133+000	No9

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
Impacts on ambient air	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K125+000quarry K126+215 quarry K127+000 quarry	No.9
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K123+700-K133+000	No.9
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K123+700-K133+000	No.9
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No: ✓	Fairly good	Jun. 2009 ~ Dec. 2009		
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K125+302-K133+000	No.9

Table 13-11 Implementation of Environmental Management (NO. 10 Contract Section)

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
Impacts on surface water quality	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:	Greatly reducing pollution to surrounding rivers and ditches. Surrounding residents all have good comments to the project and no complaint was received	Jun. 2009 ~ Dec. 2009	All bridges in the route	10
		Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes:	No:		Jun. 2009 ~ Dec. 2009		

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No:					
Noise impact	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	All bridges in the route, No. 1, 2, 3 prefabrication sites	10	
	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009			
	Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No: ✓	Jun. 2009 ~ Dec. 2009		10	
	Impacts of transport route	Optimizing alignment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	All access roads	10	
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	quarry	10	
	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	No. 1, 2, 3 prefabrication site	10	
	Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	quarry	10	
	Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	All the route	10	
	Impacts on	Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	Quarry	10

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
ambient air	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes: ✓	No:	Significantly reducing emission of fugitive dust	Jun. 2009 - Dec. 2009	quarry	10
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Reducing emission of fugitive dust to sensitive areas	Jun. 2009 - Dec. 2009	Access roads	10
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes:	No: ✓	Generating little fugitive dust	Jun. 2009 - Dec. 2009	All the route	10
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Reducing emission of fugitive dust	Jun. 2009 - Dec. 2009	All the route	10

Table 13-12 Implementation of Environmental Management (NO. 11 Contract Section)

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
Impacts on surface water quality	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:	Fairly good	Jun. 2009 - Dec. 2009	K145+800-K152+000	11
		Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes: ✓	No:	Fairly good	Jun. 2009 - Dec. 2009	K145+800-K152+000	11
	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Fairly good	Jun. 2009 - Dec. 2009	K145+800-K152+000	11

Environmental Impacts/problems	Mitigation measures	Implementation status	Effect	Implementation time	Location (pile No.)	Contract Section	
Noise impact	Wastewater containing sediments and pollutants generated during tunnel construction	是: 否:		Jun. 2009 ` Dec. 2009			
	Domestic wastewater discharged from construction campsites	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K145+800-K152+000	11	
	Impacts of transport route	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11	
	Impacts of construction near sensitive points	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11	
	Impacts of concrete mixing stations to sensitive points	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11	
	Impacts of construction at night to sensitive points	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11	
	Impacts of blasting	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11	
	Impacts on ambient	Impacts of quarries, mixing stations and asphalt station to sensitive points	Yes: ✓ No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
air	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes:	No:		Jun. 2009 ` Dec. 2009		
	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes:	No:		Jun. 2009 ` Dec. 2009		
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Fairly good	Jun. 2009 ` Dec. 2009	K143+800-K154+700	11
Impact on Chengbi Lake Nature Reserve	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:		Jun. 2009 ` Dec. 2009		
	Oil leakage of equipment and ships	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:	Fairly good	Jun. 2009 ` Dec. 2009	K145+800-K152+000	11
	Waste water discharged from bridge construction sites (prefabrication site)	Checking the maintenance of construction equipment	Yes: ✓	No:	Fairly good	Jun. 2009 ` Dec. 2009	K145+800-K152+000	11
	Impacts of emergency accidents	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Fairly good	Jun. 2009 ` Dec. 2009	K145+800-K152+000	11
Impacts of construction campsites at the road section	Working out leakage prevention scheme for emergency accidents	Prohibiting setting of campsites at the section	Yes: ✓	No:	No	Jun. 2009 ` Dec. 2009	K145+800-K152+000	11
			Yes: ✓	No:	Fairly good	Jun. 2009 ` Dec. 2009	K145+800-K152+000	11

Table 13-13 Implementation of Environmental Management (NO. 12 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
Impacts on surface water quality	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	K157+042	12
		Waste generated during drilling being settled in settling tanks	Yes: ✓	No:			
	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes:	No:	Jun. 2009 ~ Dec. 2009		
	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	No. 1, 2, 3, 4 prefabrication	12
Noise impact	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes:	No:	Jun. 2009 ~ Dec. 2009		
	Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009	Construction campsites (K157+900, K161+800, K163+400)	12
	Impacts of transport route	Optimizing alignment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009		12
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:	Jun. 2009 ~ Dec. 2009		12

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No:					
Impacts on ambient air	Impacts of concrete mixing stations to sensitive points	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12	
	Impacts of construction at night to sensitive points	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12	
	Impacts of blasting	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009	K162+800	12	
	Impacts of quarries, mixing stations and asphalt station to sensitive points	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009	K161+800, K163+400	12	
	Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12	
	Impacts of transport routes near sensitive points to those points	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009	AK0+000 ~ +300, K158+000 ~ +400	12	
	Fugitive dust generated by transport vehicles	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12	
	Impact of high-speed transport	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12	
	Slurry generated in drilling and pier construction	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009	K157+042	12	
		Locating the stations far from sensitive points						
		Optimizing construction period. Construction from 22:00 to 06:00 is prohibited.						
		Informing residents living within 500m to the sites in advance						
	Setting the spots beyond 300m in leeway direction to the residential areas nearby							
	Installing dust removal equipment							
	Water spraying							
	Covering with water-proofing clothes							
	Reducing the speed							
	Recycling utilization of slurry							

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No:				
on Chengbi Lake Nature Reserve	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
	Checking the maintenance of construction equipment	Yes:	No:		Jun. 2009 ~ Dec. 2009		
	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009	No. 1, 2, 3, 4 prefabrication	12
	Working out leakage prevention scheme for emergency accidents	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12
	Prohibiting setting of campsites at the section	Yes: ✓	No:	Remarkable effects	Jun. 2009 ~ Dec. 2009		12

Table 13-14 Implementation of Environmental Management (NO. 13 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes:	No: ✓				
Impacts on surface water quality	Recycling utilization of slurry	Yes:	No: ✓		Jun. 2009 ~ Dec. 2009		№13
	Waste generated during drilling being settled in settling tanks	Yes:	No: ✓				
	Checking the maintenance of construction equipment	Yes:	No: ✓		Jun. 2009 ~ Dec. 2009		№13
Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Fairly good	Jun. 2009 ~ Dec. 2009	K170+500	№13

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section	
		Yes: ✓	No: ✗					
Noise impact	Wastewater containing sediments and pollutants generated during tunnel construction	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K167-850	No13	
	Domestic wastewater discharged from construction campsites	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K168+200	No13	
	Impacts of transport route	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009		No13	
	Impacts of construction near sensitive points	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K173+200	No13	
	Impacts of concrete mixing stations to sensitive points	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K170+500	No13	
	Impacts of construction at night to sensitive points	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K173+300、K171+100	No13	
	Impacts of blasting	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K173+300、K171+100	No13	
	Impacts on ambient air	Impacts of quarries, mixing stations and asphalt station to sensitive points	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K170+500、K168+100	No13
		Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Yes: ✓	No: ✗	Fairly good	Jun. 2009 ~ Dec. 2009	K168+100、K170+500、K177+100 quarry	No13

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No: ✗				
Impact on Chengbi Lake Nature Reserve	Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No: ✗	Fairly good	Access road	No.13
	Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No: ✗	Fairly good	Access road	No.13
	Impact of high-speed transport	Reducing the speed	Yes: ✓	No: ✗	Fairly good	Access road	No.13
	Slurry generated in drilling and pier construction	Recycling utilization of slurry	Yes: ✓	No: ✗			No.13
	Oil leakage of equipment and ships	Waste generated during drilling being settled in settling tanks	Yes: ✓	No: ✗			No.13
		Checking the maintenance of construction equipment	Yes: ✓	No: ✗			No.13
		Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No: ✗	Fairly good	KL70+500, KL68+300, KL76+200 prefabrication sites	No.13
		Working out leakage prevention scheme for emergency accidents	Yes: ✓	No: ✗	Fairly good		No.13
		Prohibiting setting of campsites at the section	Yes: ✓	No: ✗	Fairly good		No.13

Table 13-15 Implementation of Environmental Management (NO. 14 Contract Section)

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
		Yes: ✓	No: ✗				
Impacts	Slurry generated in drilling and pier	Recycling utilization of slurry	Yes: ✓	No: ✗	Fairly good	Nov. 12, 2008 ~ Jan. 17, 2009	KL13+662 NO. 14

Environmental Impacts/problems		Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
on surface water quality	construction	Waste generated during drilling being settled in settling tanks	Yes: ✓	No:				
	Oil leakage of equipment and ships	Checking the maintenance of construction equipment	Yes: ✓	No:	No construction of ships and pollution caused by construction vehicles to water and soil was controlled satisfactorily	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14
	Waste water discharged from bridge construction sites (prefabrication site)	Retaining the wastewater and divert it into temporary settling tanks	Yes: ✓	No:	Perfect wastewater discharge system in prefabrication sites and mixing stations. All wastewater has been settled before being discharged.	Jan. 18, 2009 May. 31, 2010	LK14+200 LK5+220	NO. 14
	Wastewater containing sediments and pollutants generated during tunnel construction	Setting SS separation system	Yes: ✓	No:	All wastewater has been settled before being discharged and screen has been set to separate SS.	Jul. 13, 2008 May 31, 2009	LK0+345	NO. 14
	Domestic wastewater discharged from construction campsites	Treating with tertiary septic tanks	Yes: ✓	No:	Domestic wastewater has been settled with septic tanks	Apr. 12, 2008 Oct. 31, 2010	LK12+300	NO. 14
	Impacts of transport route	Optimizing alignment	Yes: ✓	No:	Transport route is reasonable	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14
	Impacts of construction near sensitive points	Utilizing low-noise-level equipment	Yes: ✓	No:	Being controlled satisfactorily	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14
	Impacts of concrete mixing stations to sensitive points	Locating the stations far from sensitive points	Yes: ✓	No:	Being controlled satisfactorily	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14

Environmental Impacts/problems	Mitigation measures	Implementation status		Effect	Implementation time	Location (pile No.)	Contract Section
Impacts of construction at night to sensitive points	Optimizing construction period. Construction from 22: 00 to 06: 00 is prohibited.	Yes: ✓	No:	Being satisfactorily controlled	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14
Impacts of blasting	Informing residents living within 500m to the sites in advance	Yes: ✓	No:	Being satisfactorily controlled	Jul. 13, 2008 May. 31, 2009	LK0+000 LK23+960	NO. 14
Impacts of quarries, mixing stations and asphalt station to sensitive points	Setting the spots beyond 300m in leeway direction to the residential areas nearby	Yes: ✓	No:	Being satisfactorily controlled	Apr. 12, 2008 Oct. 31, 2010	LK14+200 LK5+220	NO. 14
Impact of fugitive dust generated from cement and aggregate centralized treatment spots	Installing dust removal equipment	Yes: ✓	No:	Being satisfactorily controlled	Apr. 12, 2008 Oct. 31, 2010	LK14+200 LK5+220	NO. 14
Impacts of transport routes near sensitive points to those points	Water spraying	Yes: ✓	No:	Water spraying has been made in the area generating large amount of fugitive dust	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14
Fugitive dust generated by transport vehicles	Covering with water-proofing clothes	Yes: ✓	No:	Being satisfactorily controlled	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14
Impact of high-speed transport	Reducing the speed	Yes: ✓	No:	Running speed has been controlled. Speed limit signs have been set.	Apr. 12, 2008 Oct. 31, 2010	LK0+000 LK23+960	NO. 14

8. Assessment Results

8.1 Summary of Noise Monitoring

The monitoring results within the second half of the year show that the acoustic levels in daytime and at night in the sensitive points within 60m to the highway, including residential areas and schools complied with *Standard of Acoustic Environment of Urban Area* (National Standard GB3096-2008) except for Bantao Village (K62+120) and Xianke Primary School in Liangba Village (K126+450), which was 0.7~1.4dB (A) higher than the standard at night. Thus, it is recommended to avoid construction at noon (12: 00~02: 00) and at night (10: 00~07: 00). Any construction activities required to be carried out at the special period should not start until permission license is issued by relevant environment protection agencies to the construction units.

8.2 Summary of Ambient Air Quality Monitoring

It is shown by the monitoring results that the values of TSP and CO in all monitoring points were all within the grade II standards of *Standard of Ambient Air Quality* (GB3095-1996). The percentage of TSP value in monitoring points to the standard value ranges from 53% ~ 95.7% while that of CO vary between 20% and 37.5%. The TSP values in concrete mixing system in particular even reached 70.8%~111.4% of the standard value and CO values were only 22.5% ~ 32.5%. In conclusion, the concrete mixing system has brought fairly significant impact to surrounding environment with the max. TSP excessive rate of 11.4%, but its impact in term of CO is fairly small.

Construction units have taken corresponding measures like water spraying in sensitive points in order to mitigate fugitive dust impact. However, it is revealed from the monitoring data of concrete mixing system that TSP value was still quite high and even exceeded standard in certain period. Thus, it is suggested to locate the mixing system at the point in the leeway of sensitive points and beyond 300m to residential area. If the system has been set at this point, special attention should be attached to protect its pollution.

8.3 Summary of Surface Water Environment Quality Monitoring

It is observed from the monitoring results in the second half of 2009 that all monitoring items at the sections 500m to the upper stream and downstream of Chengbi River Reservoir

Bridge and those at the sections 500m to the right of Tangxing Reservoir Bridge could respectively meet grade II and III standards in *Standard of Surface Water Resource Quality*. From the results, it is also known that water quality at the sections varies slightly within the second half of year in construction period.

Besides, no random discharge of domestic and production wastewater into Chengbi River Reservoir and Tangxing Reservoir could be found in the same period. With the implementation of the project, it is suggested that the construction units conduct centralized treatment to production and domestic wastewater and discharge of wastewater into Chengbi River Reservoir, source of potable water, be forbidden.

8.4 Complaints

During monitoring process, investigation has been conducted to the affected local residents about the project impacts in the form of interview and questionnaire. According to investigation results, complaints raised by residents about the environmental problems caused by highway construction mainly focus on fugitive dust. Monitoring results show that project construction did cause certain impact to sensitive points, but the monitoring value just exceeded the standards occasionally .

In conclusion, it is found from the monitoring results of ambient air, acoustic environment and surface water environment that thanks to great attention paid by project owners and contractors to environmental protection, the impact of project during the construction period is still acceptable though the monitoring values of noise and air pollutants were higher than the detention limits at certain area and period, but still within acceptable levels. Construction units have taken countermeasures to mitigate most environmental impacts. It is hoped that construction units can insist in protecting environment while construction so as to minimize the environmental impacts of the project in future construction.

Chapter 2 Environmental Impact and Monitoring of Local Roads

Entrusted by Longlin – Baise Express Highway Development Co. Ltd., Communication Environmental Monitoring Center Of Guangxi Zhuang Autonomous Region collected information about the subproject of Longlin – Baise Express Highway Project – 4 local roads and monitor its implementation process. According to collected information, it is found that Tianlin – Leye Highway and Jingxi – Longbang have been under construction. For the former highway, the section under construction is from Hekou to Lizhou while bidding for the other sections are still ongoing. For the latter highway, pavement engineering is in process. Construction headquarter for Tianyang to Dingye Highway has just been set up and is preparing for the bidding of the subproject. As for De'er – Shali Highway, construction headquarter hasn't been established.

1. Implementation Progress and Environmental Impact of Tianlin – Leye Highway

1.1 Implementation Progress and Environmental Impact

Please refer to table 14 for implementation progress and environmental impact of No. 1 Contract Section of Tianlin-Leye Highway.

Table 14 Monthly Implementation Process of No. 1 Contract Section of Tianlin – Leye Highway in the Second Half of 2009

Contract Section	Construction Period	Construction Content	Completion percentage	Environmental problems
No 1	Jul. 2009	Excavation of subgrade, filling of subgrade; mortar rubble retaining walls; bridge construction; construction of graded broken stone bed course	Excavation of subgrade: 94% completed, filling of subgrade: 90% completed; mortar rubble retaining walls: 93%; bridge construction: 47%; construction of graded broken stone bed course: 26% completed.	No impact to surrounding environment
No 1	Aug. 2009	Excavation of subgrade, filling of subgrade; mortar rubble retaining walls; bridge construction; construction of graded broken stone bed course	Excavation of subgrade: 100% completed, filling of subgrade: 100% completed; mortar	No impact to surrounding environment

			rubble retaining walls: 100%; bridge construction: 64%; construction of graded broken stone bed course: 43% completed.	
No 1	Sep. 2009	Bridge construction; construction of graded broken stone bed course; construction of cement stabilized macadam base course	Bridge construction: 72%; construction of graded broken stone bed course: 68% completed; construction of cement stabilized macadam base course: 18% completed	No impact to surrounding environment
No 1	Oct. 2009	Bridge construction; construction of graded broken stone bed course; construction of cement stabilized macadam base course	Bridge construction: 84%; construction of graded broken stone bed course: 100% completed; construction of cement stabilized macadam base course: 43% completed	No impact to surrounding environment
No 1	Nov. 2009	Bridge construction; construction of cement stabilized macadam base course; construction of asphalt seal coat	Bridge construction: 91%; construction of cement stabilized macadam base course: 76% completed; construction of asphalt seal coat: 25% completed	No impact to surrounding environment
No 1	Dec. 2009	Bridge construction; construction of cement stabilized macadam base course; construction of asphalt seal coat	Bridge construction: 95%; construction of cement stabilized macadam base course: 100% completed; construction of asphalt seal coat: 83% completed	No impact to surrounding environment
No 1	Jan. 2010	Bridge construction; construction of asphalt seal coat	Bridge construction: 100%; construction of asphalt seal coat: 100% completed	No impact to surrounding environment

2. Implementation Progress and Environmental Impact of Jingxi - Longbang Highway

2.1 Implementation Progress and Environmental Impact

Please refer to table 15-1~2 for implementation progress and environmental impact of No. 1 ~5 Contract Section of Jingxi – Longbang Highway in the second half of 2009.

Table 15-1 Monthly Implementation Process of Jingxi -- Longbang Highway in the Second Half of 2009

Contract section	Construction period	Construction content	Environmental problems
No 1-1	Jul. 2009 ~ Dec. 2009	Subgrade, pavement, bridge and culverts	No complaint
No 1-2	Jul. 2009 ~ Dec. 2009	Subgrade, pavement, bridge and culverts	No complaint
No 1-3	Jul. 2009 ~ Dec. 2009	Subgrade, pavement, bridge and culverts	No complaint
No 1-4	Jul. 2009 ~ Dec. 2009	Subgrade, pavement, bridge and culverts	No complaint
No 1-5	Jul. 2009 ~ Dec. 2009	Subgrade, pavement, bridge and culverts	No complaint

3. Summary

Contract section	Pile No.	Construction content	Work quantity	Amount (10,000yuan)	Completion percentage (%)
No 1-1	K0+000~K10+700	Excavation of subgrade	419059m ³	592.7124	100
		Filling of subgrade	447904 m ³	165.5007	100
		Culverts	841 米/48 culverts	275.7876	100
		Bridges		357	98
		Base course	96665m ²	55.4982	100
		Cement stabilized macadam base course	80153 m ²	294.217	100
No 1-2	K10+700~K17+740	Excavation of subgrade	188405 m ³	297.9532	100
		Filling of subgrade	175009 m ³	111.6723	100
		Culverts	383 米/19 culverts	163.3047	91
		Bridges		396	94
		Base course	43370 m ²	53.1738	100
		Cement stabilized macadam base course	15477m ²	176.7737	100

№1-3	K17+740~ K24+940	Excavation of subgrade	399150 m ³	497.4448	100
		Filling of subgrade	199361 m ³	114.6732	100
		Culverts	595 米/29 culverts	203.29	100
		Bridges		67.48	100
		Base course	74967m ²	54.8772	100
		Cement stabilized macadam base course	63128m ²	235.6769	98
№1-4	K24+940~ K35+890	Excavation of subgrade	485276m ³	884.9384	98
		Filling of subgrade	297842m ³	143.6546	98
		Culverts	533 米/29 culverts	302.3241	96
		Bridges		171.9266	95
		Base course	28401m ²	60.5463	92
		Cement stabilized macadam base course	—	284.2992	83
№1-5	K35+890~ K47+432	Excavation of subgrade	755721m ³	1709.2802	95
		Filling of subgrade	511024m ³	203.6341	94
		Culverts	368 米/25 culverts	267.9527	94
		Bridges		49	100
		Base course	43277m ²	63.8645	90
		Cement stabilized macadam base course	11216m ²	306.0332	83

Up to now, the completed investment of the subproject has reached RMB216,894,380, about 86.36% of the total. Among them, the completed investment for capital construction was RMB159,968,900 while that for the second and the third part of the subproject was RMB56,925,480.

Based on field reconnaissance and monitoring results provided by local environmental management departments, no violation of various environmental rules and regulations have been found during construction of the above 2 highways. Construction units have taken some environmental protection measures according to EIA, such as water spraying, treatment of construction wastewater, optimization of construction period. Furthermore, no complaints has been received during the process of interview to local residents.

Chapter 3 Environmental Impact of Bus Stations

Data provided by Baise City Highway Administration shows that the environmental impact of the construction of the 50 bus stations is limited. Less fugitive dust will be generated from the small earthwork. Fairly slight impact will be brought to the water body by little construction wastewater. Besides, construction period are mainly concentrated in day time. No impact will be caused to the villagers at night. Please find table 16 for implementation progress of village bus stations.

Development Project (III) Table16 Bus Station Summary Sheet

序号	车站名称 (乡镇)	车站名称 (乡镇)	县 (区)	县 (区)	服务村庄 (个)	服务人口 (人)	新建/扩建E	完成后等级	施工年份	合同包号码	合同总额 (万元)	亚行支付金额 * (万元)	新增占地面积 (亩)	其中: 耕地面积 (亩)	占地补偿金额 (万元)	拆迁房屋面积 (m ²)	搬迁户数 (户)	拆迁补偿金额 ** (万元)	是否需要环境评价	开工日期	完工日期	完成%	分配比重	按比重进度 %
No	Station (Township)	Station (Township)	County	County	Number of Beneficiary Villages	Beneficiary Population	New/Expansion	Achieved Class	Construction Year	Contract Package Number	Contract Amount (CN¥10,000)	ADB financing (CN¥10,000)	Land Acquisition (mu)	of which: farmk and (mu)	Land compensation fund (CN¥10,000)	House demolition (m ²)	Relocated households (H)	Demolition compensation ** (CN¥10,000)	EIA Requirement (Yes/no)	Work Start	Work complete	Complete %	Assigned Weight	Weighted progress %
1	泮水乡泮水客运站	Banshu i Bus Station ***	石江区	石江区	9	12474	N	V	2007	百衣客-1	24.1	19.28	5.4	0	3	0	0	0	no	2007. 5.12	2008. 6.2	100	1.7	1.7 %
2	样周镇样周客运站	Xiangzhou Bus Station**	田东	田东	21	49200	N	V				0	30	0	0				no				1.7	
3	江城镇江城客运站	Jiangcheng Bus Station	田东	田东	8	22348	N	V				0	4	0	0				no				1.7	
4	作登乡作登客运站	Zuodeng Bus Station	田东	田东	21	37888	N	V				0	5.4	0	0				no				1.7	
5	林逢镇林逢客运站	Linfeng Bus Station	田东	田东	21	50825	N	V	2009	百衣客-5	23.83	19.06	2.5	0	17	0	0	0	no	2009. 2.18	2009. 6.18	100	1.7	1.7 %

6	凤梧乡凤梧客运站	Fengwu Bus Station	平果	Pingguo	18	36026	N	V	2007	白乘客-6	35.18	28.15	2.69	0	9.16	0	0	0	0	no	2007.8	2008.5	100	1.7	1.7%
7	太平镇太平客运站	Taping Bus Station	平果	Pingguo	20	71000	N	III	2009	白乘客-7	110	88	5	0	21	0	0	0	0	no	2009.3.8		20	10.0	
8	黎明乡黎明客运站	Liming Bus Station	平果	Pingguo	10	21680	N	V	2009	白乘客-8	42	33.6	0.76	0	0	0	0	0	0	no	2009.11.8		10	1.7	
9	同老镇同老客运站	Tonglao Bus Station	平果	Pingguo	9	15650	N	V	2009	白乘客-9	32	25.6	2.23	0	10.93	0	0	0	0	no	2009.3.9	2009.5.30	100	1.7	1.7%
10	巴头乡巴头客运站	Batou Bus Station	德保	Debao	14	22798	N	V	2007	白乘客-10	25	20	3.14	3.14	3.15	0	0	0	0	no	2007.06.18	2007.08.30	100	1.7	1.7%
11	东凌乡东凌客运站	Dongling Bus Station	德保	Debao	19	39484	N	V	2008	白乘客-11	30	24	2.77	1.05	9.55	11.46	1	6	no	2008.04.20	2008.08.12	100	1.7	1.7%	
12	燕洞乡燕洞客运站	Yandong Bus Station	德保	Debao	19	33669	N	V					3.89	3.89	19.45	0	0	0	no				1.7		
13	足荣乡足荣客运站	Zurong Bus Station	德保	Debao	10	22609	N	V					3.96	3.96	28.8	0	0	0	no				1.7		
14	荣华乡荣华客运站	Ronghua Bus Station	德保	Debao	10	19677	N	V	2009	白乘客-14	23.1	18.48	3.21	3.21	4.7	76.45	3	0.4	no	2009.01.01	2009.06.30	100	1.7	1.7%	
15	龙邦镇龙邦客运站	Longban Bus Station	靖西	Jingxi	21	36821	N	III	2009	白乘客-15			6.66	0	30	0	0	0	no	2009.9		80	10		
16	渠阳乡渠洋客运站	Quyang Bus Station	靖西	Jingxi	18	31391	N	V	2009	白乘客-16			5.16	0	16.44	0	0	0	0	no	2009.8		20	1.7	
17	化桐乡化桐客运站	Huadong Bus Station	靖西	Jingxi	15	21020	N	V	2009	白乘客-17	21	16.8	7.2	0	18.26	0	0	0	0	no	2009.3	2009.1	100	1.7	1.7%
18	龙临镇龙临客运站	Longlin Bus Station	靖西	Jingxi	27	50799	N	V	2006	白乘客-18	21.25	17	7.4	0	15.77	0	0	0	0	no	2006.1	2007.1	100	1.7	1.7%

19	六院乡六院客运站	田林	Tianlin	18	16864	N	V	2007	百农客-20	25	20	2.06	0	9	0	0	0	0	0	no	2007.5	2008.3	100	1.7	1.7%
20	利周乡利周客运站	田林	Tianlin	9	16235	N	V														2009.8		90	1.7	
21	旧州乡旧州客运站	田林	Tianlin	15	20045	N	V	2009	百农客-21	19	15.2	1.82	0	2.61	0	0	0	0	0	no	2009.8		100	1.7	
22	那比乡那比客运站	田林	Tianlin	5	10000	N	V	2009	百农客-22	35.5	28.4	4	0	6	0	0	0	0	0	no	2009.4.29	2009.7.29	100	1.7	1.7%
23	隆或乡隆或客运站	隆林	Longlin	15	27830	N	V	2006	百农客-23	32	25.6	3.82	3.82	6.2	0	0	0	0	0	no	2006.12.08	2007.04.07	100	1.7	1.7%
24	德峨乡德峨客运站	隆林	Longlin	15	33507	N	V	2007	百农客-24	27	21.6	2.5	2.5	3.84	0	0	0	0	0	no	2007.11.10	2008.05.10	100	1.7	1.7%
25	克长乡克长客运站	隆林	Longlin	13	26189	N	V	2007	百农客-25	27	21.6	2.5	2.5	4	0	0	0	0	0	no	2007.11.10	2008.05.10	100	1.7	1.7%
26	者保乡者保客运站	隆林	Longlin	13	28609	N	V	2008	百农客-26	26.45	21.16	2.5	2.5	4.4	0	0	0	0	0	no	2008.10.15	2009.10.14	100	1.7	1.7%
27	蛇场乡蛇场客运站	隆林	Longlin	8	16642	N	V	2008	百农客-27	24.51	19.61	2.5	2.5	6.29	0	0	0	0	0	no	2008.09.15	2009.04.08	100	1.7	1.7%
28	金钟山乡金钟山客运站	隆林	Longlin	6	13200	N	V	2008	百农客-28	19.35	15.48	2	2	3.38	0	0	0	0	0	no	2008.10.15	2009.10.14	100	1.7	1.7%
29	沙梨乡沙梨客运站	隆林	Longlin	7	15749	N	V	2008	百农客-29	35.88	28.70	2.5	2.5	4	0	0	0	0	0	no	2008.10.20	2009.06.25	100	1.7	1.7%
30	介廷乡介廷客运站	隆林	Longlin	8	13910	N	V	2009	百农客-30	23.47	18.77	2.5	2.5	6	0	0	0	0	0	no	2009.08.28	2009.12.03	100	1.7	1.7%
31	猪场乡猪场客运站	隆林	Longlin	8	20300	N	V	2009	百农客-31	23.47	18.77	2.5	2.5	4	0	0	0	0	0	no	2009.08.28	2009.12.05	100	1.7	1.7%

32	草步草步客运站	降林	Longlin	15	23594	N	V	2009	白衣客-32	24.50	19.60	2.5	2.5	4.8	0	0	0	0	no	2009.10.05		70	1.7	
33	柳枝镇柳枝客运站	降林	Longlin	7	12000	N	V				0								no			1.7		
34	岩茶乡岩茶客运站	降林	Longlin	9	20645	N	V				0								no			1.7		
35	普浪乡普浪客运站	降林	Longlin	11	18009	N	V				0								no			1.7		
36	那佐乡那佐客运站	西林	Xilin	6	8630	N	V	2007	白衣客-36	32	25.6	3	3	9	0	0	0	0	no	2007.0	2007.1	100	1.7	1.7%
37	足别乡足别客运站	西林	Xilin	12	13395	N	V	2009	白衣客-37	25	20	3	3	15	0	0	0	0	no	2009.6.17	2009.9.2	100	1.7	1.7%
38	西平乡西平客运站	西林	Xilin	18	26592	N	V	2009	白衣客-38	30	24	2.5	2.5	7.5	0	0	0	0	no	2009.10		40	1.7	
39	逻沙乡逻沙客运站	乐业	Leye	11	18460	N	V	2009	白衣客-39	20.26	16.21	3	0	19.26	0	0	0	0	no	2009.2.21	2009.7.30	100	1.7	1.7%
40	雅长乡雅长客运站	乐业	Leye	5	8499	N	V	2009	白衣客-40	40	32	3	0	0	0	0	0	0	no	2009.1	2010.0	60	1.7	
41	花坪乡花坪客运站	乐业	Leye	7	15510	N	V	2008	白衣客-41	40	32	2.7	0	10	0	0	0	0	no	2007.1	2008.0	100	1.7	1.7%
42	幼平乡幼平客运站	乐业	Leye	11	19226	N	V												no			1.7		
43	朝里乡朝里客运站	凌云	Lingyun	6	8000	N	V	2007	白衣客-43	15.7	12.56	3.59	3.59	7.8	0	0	0	0	no	2008.4	2009.2	100	1.7	1.7%

44	沙里乡沙里客运站	凌云	Lingyun	12	17000	N	V	2008	白农客-44	16.7	13.36	1.97	1.97	10.3	0	0	0	no	2008.9	2009.6	100	1.7	1.7%
45	下甲乡下甲客运站	凌云	Lingyun	36	21000	N	V	2009	白农客-45	35	28	3.26	0	12	0	0	0	no	2009.12.14		20	1.7	
46	坡荷乡坡荷客运站	那坡	Napo	13	15165	N	V	2007.7	白农客-46	30	24	3.47	3.47	8.7	0	0	0	no	2007.7	2008.4	100	1.7	1.7%
47	白省乡白省客运站	那坡	Napo	13	14835	N	V	2009.11	白农客-47	20	16	3	3	15.2	0	0	0	no	2009.11		20	1.7	
48	德隆乡德隆客运站	那坡	Napo	13	18748	N	V	2009.11	白农客-48	25	20	3	3	10.5	0	0	0	no	2009.11		20	1.7	
49	百南乡百南客运站	那坡	Napo	8	8196	N	V	2009.11	白农客-49	25	20	3.105	3.105	8.7	0	0	0	no	2009.11		20	1.7	
50	白合乡白合客运站	那坡	Napo	10	16237	N	V	2009.11	白农客-50	20	16	4.305	4.305	12.9	0	0	0	no	2009.11		20	1.7	

Chapter 4 Environmental Impact of Village Roads

Assessment to village roads can not be provided in the report since Communication Department of Guangxi Zhuang Autonomous Region hasn't identified the specific components of the village road project by the end of 2009.

Photos for monitoring points in Jul.



Lawei Village



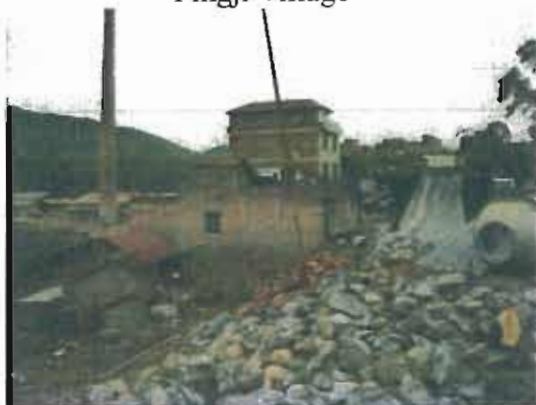
Weile Primary School



Pingji Village



Hongqi Village



Xinning Village



Changzhai Village

Photos for monitoring points in Aug.



Zhenian Village



Zhesu Village



Lucheng Junior Middle School



Yanzhan Village



Liangba Village



Nami



Nade Village

Photos for monitoring points in Sep.



Shitoulin Village



Nashe Village



Lucheng Town



Hekou Town



Pingwang Village



Liangba Village



Nami



Wanyu Village



No. 2 mixing station (K148+000)

Photos for monitoring points in Oct.



Bangba Village



Weile Village



Hope Primary School in Zhenian



Pingman Village



Xinning Village



Yanka Village



Nalai Village



Nanka Village



No. 9 mixing station (K148+000)

Photos for monitoring points in Nov.



Lawei Village K5+200



Weile Primary School K6+300



Pingman Village



Bantao Village K62+120



Nashe Village K65+800



Pingji Village K76+000



Lucheng Junior Middle School K78+900



No. 9 mixing station (K148+000)

Photos for monitoring points in Dec.



Nashe Village K65+800



Hongqi Village K87+ 800



Yanzhan Village K90+600



Pingwang Village K108+300



Xianke Primary School in Liangba K126+450



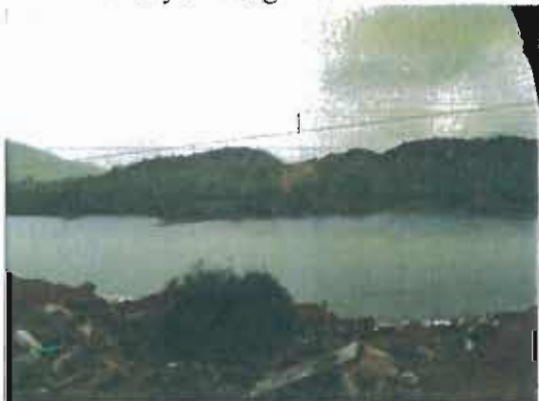
Nami K128+800



Wanyu Village K149+500



Xinzhai Village LK15+200



Where Chengbi Reservoir Bridge Crossing the River



No. 9 mixing station (K148+000)



Settling tank for pile foundation of Chengbi Reservoir Bridge (1)_____ (2)