

Environmental Monitoring Report

Semestral Report
September 2014

PRC: Integrated Development of Key Townships in Central Liaoning

Prepared by Liaoning Urban Construction and Renewal Project Office for the People's Republic of China and the Asian Development Bank.

NOTE

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**PEOPLE'S REPUBLIC OF CHINA
INTEGRATED DEVELOPMENT OF KEY TOWNSHIPS
IN CENTRAL LIAONING
(ADB Loan No. 2901-PRC)**

**Semi-annual Environmental
Monitoring Report
(As of the End of June 2014)**

**Prepared by:
Liaoning Urban Construction and Renewal Project Office
HJI Group Corporation**

September 2014

ABBREVIATIONS

ADB	–	Asian Development Bank
CNY	–	Chinese Yuan
EIA	–	Environmental Impact Assessment
EMO	–	Environmental Management Office
EMP	–	Environmental Management Plan
EPB	–	Environmental Protection Bureau
EPMS	–	Environmental Protection and Monitoring Station
GEPMS	–	Gaizhou Environmental Protection and Monitoring Station
IA	–	Implementing Agency
LPEPB	–	Liaoning Provincial Environmental Protection Bureau
LPG	–	Liaoning Provincial Government
MEMR	–	Monthly environmental management reports
PMO	–	Project Management Office
SEMR	–	Semiannual Environmental Monitoring Report
SEIA	–	Summary Environment Impact Assessment
WWTP	–	Wastewater Treatment Plant

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I INTRODUCTION

This semi-annual environmental report describes the implementation of the environmental monitoring and implemented mitigation measures recommended in the environmental impact assessment (EIA) reports and the summary analyses of the environmental monitoring data collected from 1 January to 30 June 2014 for the Integrated Development of Key Townships in Central Liaoning Project (the Project).

Based on the Project Agreement, LPG shall cause the Participating Township Governments and the Project Implementing Agencies to ensure that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of the Borrower relating to environment, health and safety; (b) the Environmental Safeguards; and (c) all measures and requirements set forth in the Environment Impact Assessment (EIA), the Environment Management Plan(EMP), and any corrective or preventative actions set forth in a Safeguards Monitoring Report. LPG shall cause the Project Implementing Agencies to incorporate such mitigation and monitoring measures into the design and bidding documents and construction contracts.

LPG shall cause the Participating Township Governments and the Project Implementing Agencies to ensure that emergency preparedness and response mechanisms are developed for the Project in compliance with the Borrower's relevant regulations and the EMP, and that these mechanisms are incorporated into the emergency preparedness and response system of the respective cities and districts. LPG shall cause the concerned Participating Township Governments and Project Implementing Agencies to ensure that streetlights and traffic lighting system are installed with energy-saving technology along the roads constructed/rehabilitated under the Project.

LPG shall ensure that Associated Facilities are constructed, operated, maintained, and monitored in strict conformity with (a) the Borrower's all applicable laws and regulations, including national, provincial, and municipal laws and regulations and standards on environmental protection, district heating, health, labor, and occupational safety; and (b) all environmental mitigation and monitoring measures detailed in the applicable environmental impact assessments for the Associated Facilities under the guidance of the Liaoning Province Environmental Protection Bureau or other designated environmental monitoring centers.

LPG shall cause the Fuxin Municipal Government and the concerned Project Implementing Agency to ensure that the deconstruction and disposal of old coal-fired boilers and single-family heating stoves follow national regulations on disposal of construction waste and standards for occupational health and safety, especially regarding hazardous materials, such as asbestos containing materials and ash residues, and will be done with approval and supervision by the Liaoning Province Environmental Protection Bureau.

LPG shall cause the Shenbei District Government and the concerned Project Implementing Agency to ensure that sewage conducted in Project sewers along roadways is treated in a manner acceptable to ADB before its discharge. LPG shall cause the concerned Project Implementing Agencies to ensure that a full predictive analysis of sensitive receptor sites along all roads is carried out and funds for noise mitigation at affected properties are reserved before construction of the Shenbei and Gaizhou roads commences.

LPG shall cause the Fuxin Municipal Government and the concerned Project Implementing Agency to ensure that an asbestos risk assessment is conducted by a licensed institute for all small boilers affected by the Project prior to implementation of Component 2. In case that presence of asbestos is identified, LPG shall ensure that an asbestos management plan is developed for all affected boiler houses. LPG shall cause the Fuxin District Government to ensure that the contractors receive adequate training on asbestos management and occupational health and safety, and that the rehabilitation or deconstruction of asbestos containing boiler houses is conducted and supervised in conformity with the approved asbestos management plan.

The project is classified as environment category A. Environment safeguards issues during construction include earthwork and soil erosion, noise and air pollution, surface water pollution, and risks to occupational and community health and safety. During operation, the main potential adverse impacts include traffic noise at some sensitive areas which will require mitigation by sound-proofing, and odor and secondary pollution from the effluent and sludge of the wastewater treatment plant (WWTP).

The Project consists of eight subprojects, including Shenbei Wastewater Treatment Subproject, Fuxin Heating Subproject, Xinmin Urban Road Subproject, Shenbei Urban Road Subproject, Heishan Urban Road Subproject, Gaizhou Urban Road Subproject, Huanren Urban Road Subproject, Benxi Waitoushan Urban Road Subproject. During the period from 1 January to 30 June 2014, only one contract for Gaizhou subproject is under construction, as a result, this semi-annual environmental monitoring report will focus on environmental compliance only for Gaizhou subproject.

Independent external environmental specialist has discussed with the IA of Gaizhou subproject for their environmental process and worked with the IA and local environmental monitoring stations from Gaizhou in regard to their responsibilities for environmental monitoring. Particular attention focuses on the monitoring, reporting compliance and the establishment of environmental management offices. Individuals from environmental monitoring offices are responsible for carrying out the required monitoring.

This report covers the following areas: (i) documentation review and compliance with environmental regulations; (ii) environmental institutional structure and responsibility; (iii) environmental monitoring; (iv) mitigation measures undertaken to minimize adverse environmental impacts arising from the construction of the Project and (v) conclusions and recommendations.

A. Basis of Semi-annual Environmental Monitoring Report

This semi-annual environmental monitoring report has been prepared based on the following documents:

- SEIA;
- EIAs;
- EMPs;
- Project Agreement;
- Report and Recommendation of the President to the Board of Directors
- External environmental monitoring reports; and
- Relevant environmental codes.

B. Environmental Procedure Review

Each of the contractors, construction supervision companies, and the IA's designated staff from the site management team are responsible for environmental monitoring and supervision. The responsibilities of these staff include day to day site environmental monitoring of their own contracts, implementation of the environmental action plan's mitigation measures, and reporting the site's environmental performance regarding the contract sections, which is mainly self-inspection and self-monitoring.

During the construction period, the construction supervision companies are responsible for the preparation and submission of monthly environmental supervision reports; meanwhile, the environmental monitoring agencies are responsible for the monitoring of environmental parameters and development of external environmental monitoring reports. The PMO has designated Mr. Sun Jian to serve as an environmental officer for this Project. The PMO, with the assistance of the independent external environmental monitoring specialist, is responsible for compiling semi-annual environmental monitoring reports.

Specific responsibilities of the IAs, contractors, local environmental monitoring centers, and construction supervision companies are defined as follows:

IA:

- Develop the environmental section of the contract;
- Provide training to contractors and all other related environmental personnel;
- Environmental review at site;
- Resolve environmental complaints;
- Develop and implement pollution prevention measures;
- Implement environmental monitoring plans;
- Provide monthly environmental supervision reports;
- Implement mitigation measures and health and safety measures; and
- Arrange for environmental meetings as necessary.

Local Environmental Monitoring Center:

- Conduct environmental monitoring and oversight; and

- Prepare external environmental monitoring reports based on data collected.

Supervision Companies (during construction period):

- Environmental management;
- Assistance in the preparation of monthly environmental supervision reports;
- Receive complaint calls; and
- Report environmental issues.

Contractors (during construction period):

- Implementation of environmental mitigation measures;
- Providing basic sanitation facilities;
- Domestic sewage treatment;
- Solid waste management;
- Noise and dust control;
- Personal protective equipment for workers; and
- Measures to ensure construction equipment meet relevant national or local emissions and noise standards.

C. Legal Requirements

All project facilities must comply with all applicable PRC environmental laws and regulations during the project implementation. The following is a list of some potentially applicable environmental laws and regulations:

- Air Pollutant Integrated Emission Standard, GB16297-2004
- Noise Limits for Construction Site, GB12523-2011
- Standard of Noise at Boundary of Industrial Enterprises, GB12348-2008
- Integrated Emission Standard of Air Pollutants, GB16297-1996
- Ambient Air Quality Standards, GB 3095-1996
- Standard of Environmental Noise in Urban Area, GB 3096-2008
- Surface Water Environment and Quality Standard, GB3838-2002

II GAIZHOU URBAN ROAD SUBPROJECT

A. Scope of Subproject

The subproject includes the following components: (1) Rehabilitate and widen Honghuayu Road (2.2km); (2) construct Beichen Road (4.3km); (3) Rehabilitate 50 alleys; (4) install storm water and sewer pipelines; (5) install street lighting; and (6) accommodate related road safety and energy-conserving facilities. The IA is Beichen Road Engineering Project Office .

B. Status and Progress

A bid opening for Honghua Yu Road and Alley Roads (GZ-C03) was held in November 2013 and the contract was signed in December 2013. The construction commenced in April 2014. Nearly 58% of the contract package completed as of the end of June 2014. The external environmental monitoring contract was signed with Gaizhou Environmental Protection and Monitoring Station (GEPMS) and the external environmental monitoring specified in the EMP has been implemented for the above-mentioned road during construction period and the external monitoring report was prepared and submitted in July 2014.

The environmental management processes were carried out in accordance with the requirements of EIAs and applicable environmental standards. The mitigation measures to control air pollution, water pollution, noise and vibration, solid waste, and soil erosion and ecology were taken during the construction period. The environmental monitoring was conducted to meet applicable environmental standards.

C. Environmental Management Office

An EMO was not formally established until mid-September. The members of the EMO are listed in **Table 2-1**. It can be seen from Table 2-1 that people from the IA, a construction supervision company, the Contractor and the environment monitoring station have been included in the EMO. The responsibilities for the IA, local environmental monitoring center, contractor and local supervision company are discussed in Section I (B). In addition to the responsibilities discussed above, the EMO also deal with grievance and the contact phone numbers are 0417-7696882 and 7800061.

Table 2-1: EMO Personnel

Name	Work Unit	Position	Titles in EMO
Zhu Yonghai	Gaizhou EPB	Deputy Director	Director
Meng Jing	GEPMS	Deputy director	Deputy director
Jiang Qingzhe	IA	Manager	Deputy director
Xu Rong	GEPMS	Monitor	Member

Name	Work Unit	Position	Titles in EMO
Mei Cunyuan	GEPMS	Monitor	Member
Cang Hengzhi	GEPMS	Monitor	Member
Zhang Yang	IA	Manager	Member
Sun Renhe	IA	Manager	Member
Tang Feng	Contractor	Project Manager	Member
He Dongming	Supervision Co	Supervision Engineer	Member

D. Environmental Monitoring Results

Based on the information provided, environmental monitoring was conducted during the constructional period. The meteorological data are provided in **Table 2-2**.

Table2-2: Meteorological Data in June 2014

Monitoring Time		Temperature (°C)	Atmospheric Pressure (kpa)	Wind Direction	Wind Velocity (m/s)
20 June	10:00	25.5	1023.4	South	3.0
21 June	10:00	27.2	1012.6	South	2.0
22 June	10:00	25.5	1029.4	Southeast	1.5
23 June	10:00	25.8	1020.0	Southeast	1.7
24 June	10:00	24.4	1025.8	South	3.4
25 June	10:00	25.7	1034.2	Southeast	1.7
26 June	10:00	26.2	1025.7	South	2.2

1. Air Quality Monitoring

Based on the actual needs, seven air monitoring locations were set up to monitor PM₁₀, NO_x and SO₂. These seven air monitoring locations are junction of Bus Station and Hongqi Street, Wenfeng Temple, junction of Beichen Road and Hada Highway, junction of Honghua Yu Road and Gaizhou Road, Honghua Yu Village, Xingyuan Village, Majia Gou Village. The specific locations are shown in **Appendix A**.

The monitoring was performed once every day from 20 to 26 June 2014. The applicable standard is Ambient Air Quality Standards, Grade II (GB3095-1996), as shown in **Table 2-3**. The results, presented in **Table 2-4**, showed that the values for PM₁₀, NO_x, and SO₂ are in compliance with the standard of 0.18 mg/m³, 0.15 mg/m³ and 0.19 mg/m³, respectively.

Table 2-3: Ambient Air Quality Standards

Standard	Item	Daily Average Concentration Limit Value (mg/m ³)
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GB3095-1996 (Grade II)	PM ₁₀	0.15
	NO _x	0.10
	SO ₂	0.15

Table 2-4: Monitoring Results of Air Quality

Unit: mg/m³

MNT Time	Item	Bus Station	Wenfeng Temple	Honghua Yu Village	Xingyuan Village	Majia Gou Village	Honghua Yu-Gaizhou Junction	Beichen-Hada Junction
20 June	PM ₁₀	0.103	0.119	0.106	0.128	0.118	0.112	0.010
	NO _x	0.012	0.014	0.019	0.023	0.016	0.017	0.015
	SO ₂	0.015	0.011	0.008	0.06	0.012	0.015	0.014
21 June	PM ₁₀	0.103	0.095	0.105	0.117	0.100	0.107	0.104
	NO _x	0.010	0.014	0.012	0.020	0.010	0.012	0.014
	SO ₂	0.007	0.014	0.010	0.011	0.014	0.016	0.015
22 June	PM ₁₀	0.094	0.092	0.093	0.100	0.103	0.109	0.095
	NO _x	0.013	0.014	0.011	0.024	0.015	0.013	0.011
	SO ₂	0.009	0.010	0.011	0.015	0.014	0.023	0.011
23 June	PM ₁₀	0.097	0.095	0.099	0.104	0.098	0.101	0.100
	NO _x	0.012	0.011	0.013	0.021	0.014	0.013	0.010
	SO ₂	0.006	0.013	0.015	0.011	0.016	0.013	0.010
24 June	PM ₁₀	0.094	0.098	0.101	0.105	0.103	0.100	0.098
	NO _x	0.015	0.014	0.012	0.022	0.015	0.012	0.016
	SO ₂	0.005	0.013	0.017	0.008	0.015	0.012	0.006
25 June	PM ₁₀	0.096	0.092	0.103	0.105	0.097	0.106	0.102
	NO _x	0.015	0.011	0.014	0.023	0.014	0.015	0.011
	SO ₂	0.010	0.014	0.009	0.009	0.014	0.015	0.011
26 June	PM ₁₀	0.095	0.101	0.097	0.100	0.103	0.098	0.103
	NO _x	0.013	0.018	0.014	0.023	0.015	0.014	0.015
	SO ₂	0.013	0.015	0.014	0.023	0.015	0.014	0.015

2. Noise Monitoring

Similarly, seven noise monitoring locations were set up to monitor noise levels. These seven noise monitoring locations are junction of Bus Station and Hongqi Street, Wenfeng Temple, junction of Beichen Road and Hada Highway, junction of Honghua Yu Road and Gaizhou Road, Honghua Yu Village, Xingyuan Village, Majia Gou Village.. The specific locations are shown in **Appendix A**.

The monitoring was performed at 10am and at 10pm., twice every day from 20 to 22 June 2014. The applicable standard is Environmental Quality Standard for Noise, Grade II (GB3096-2008), as shown in **Table 2-5**. The results, presented in **Table 2-6**, showed that the noise values are in compliance with the standard of 60 dB(A) during daytime and 50 dB(A) at night.

Table 2-5: Ambient Noise Standard

Standard	Time	Standard (LAeqdB)
GB3096-2008 (Type 2 zone)	Daytime	60
	Nighttime	50

Table 2-6: Monitoring Results of Ambient Noise Value

Unit: dB(A)

Monitoring Time		Bus Station	Wenfeng Temple	Honghua Yu Village	Xingyuan Village	Majia Gou Village	HonghuaY u-Gaizhou Junction	Beichen-Hada Junction
20 June	Daytime	50.6	53.0	48.3	49.7	51.5	48.9	51.3
	Nighttime	43.3	44.5	39.8	44.2	42.7	42.4	43.4
21 June	Daytime	52.4	53.6	49.3	51.5	51.7	50.4	51.0
	Nighttime	44.1	45.2	39.9	43.4	43.3	43.4	43.2
22 June	Daytime	52.4	53.3	49.1	51.7	51.4	50.0	51.5
	Nighttime	43.6	45.1	39.5	44.6	44.0	42.8	43.0

E. Implementation of Mitigation Measures

1. Air Quality

In regard to dust on construction sites, the contractor assigned specific person to be responsible for the air quality control. The contractor has ensured the main haul road to be paved and sprayed water to the unpaved areas and haul roads, the construction and demolition waste to store in site with shortest time, the stockpiles to be covered and the trucks carrying dusty materials to be covered by tarpaulin, and the vehicles to drive at low speed on construction sites. To reduce impacts from the asphalt plant, the plant has been equipped with a dust removal mechanism and an enclosed mixing chamber, and be located at least 500m downwind from sensitive receivers. In addition, the contractor selected appropriate time with low wind pressures to construction road surface to avoid emissions from asphalt or cement plants.

All roads and tracks used by vehicles of the contractors and supplier were kept clean and clear of all dust, mud, and extraneous materials dropped by their construction vehicles.

Equipments and machinery are maintained to a high standard to ensure efficient running and fuel-burning. High-horsepower equipments were installed with tail gas purifier.

2. Noise and Vibration

Noise isolation barriers were installed at the sites with potential noise sources to reduce adverse impacts on surrounding areas. Meanwhile, the construction time was appropriately set up to avoid affecting surrounding areas during the construction period.

Noise has been mitigated by using quiet equipment; observing good O&M of machinery; using temporary hoardings or noise barriers to shield noise sources; and stopping construction near residential areas, hotels, and hospitals in accordance with the requirements in the Chinese standards. It is required that if there are schools or places of worship near construction activities, the contractors should maintain continual communication with them to avoid noisy activities during examination and worship periods.

3. Construction Waste

The construction wastes produced during the construction period but not used for backfill, were timely delivered into the designated landfill, while the excavation soil to be used for backfill were covered with regular water spraying to avoid air pollutions to the surrounding areas. Meanwhile, trash collection bins were regularly sprayed with pesticides to reduce flies.

4. Wastewater

Recycled water was used to spray for dust control. Vehicles and equipment were properly parked in designated areas to prevent contamination of soil and surface water. Residue was removed from site and disposed in municipal landfills. In addition, based on the observation on site, the stormwater canal newly built along the Honghua Yu Road was filled with rubbish and wastewater. It was suggested that the government takes effective measures to the city management and adopts a better garbage collection system.

5. Soil Erosion and Ecology

According to information from the IA, the handling of the construction materials is limited during periods of rains and high winds. Based on the observation on site, topsoil was stripped and stockpiled carefully and earthwork disturbance areas were stabilized after earthworks have ceased at the sites.

6. Traffic Control

The increase in construction traffic has slightly caused traffic congestion and inconvenience to other vehicles, pedestrians, and shop owners. Temporary traffic management was necessary. Notice were developed diverting construction traffic from morning and afternoon peak traffic hours and regulating traffic at the road crossings. In

addition, interim roads were built up to for passengers' convenience to reduce disturbance to regular traffic.

F. Compliance with Environmental Covenants

The construction for Gaizhou component commenced during the first half of 2014. The compliance with environmental covenants has been met during the reporting period. Gaizhou IA has taken necessary actions to minimize the impact of interruptions to water supply, wastewater collection, and other utility services during project construction. The Gaizhou IA has prepared and submitted to the Liaoning PMO its environmental monitoring report. No violations of safety or environmental standards were reported during the reporting period.

G. Training

An on-the-job training regarding environment management was made in Gaizhou by the Consultant in June 2014. The training content includes daily, weekly and monthly environment records, management and relevant monitoring, and mitigation measures. Members of the EMO from the construction supervision company, the Contractor, the Client and the environment monitoring station participated in the training. Further training will be made if necessary.

H. Capacity-Building Progress

A workshop, emphasizing on ADB procedures, international best practices, and environmental monitoring and management, compliance with national and ADB standards pertaining to technical requirements, environmental management, social safeguards, procurement, and financial management, was held. On-the-job training in regard to EMP implementation and adjustment, dispute resolution, environmental processes, environmental monitoring, environmental policies and plans, wastewater management, solid waste management, and traffic and safety management, were also made during the reporting period.

As a result, the IA, PMO and the supervising company's capacities in environmental management and monitoring have been enhanced through the workshop and on-the-job trainings. An environmental management office was finally established and an environmental specialist is in place. The institutional organization and the responsibilities for each environmental position for the Liaoning PMO, local PMO, and IA have been finalized before the construction started. In addition, based on the actual requirements, continued public participation throughout the construction stage will be held to ensure the IAs' construction programs and impacts are understood and addressed in a timely manner.

I. Issues and Recommendations

Issue 1: The stormwater canal newly constructed was filled with rubbish to the nuisance and complaints of street vendors in the area.

Recommendation: It is recommended that the local government and/or relevant agencies take effective actions to ensure the wastes and rubbish produced from the nearby residents be collected and handled in an accepted way.

III OTHERSUBPROJECTS

No construction activity for all the other subprojects has been made during the reporting period, as a result, the progress in respect to mitigation measures and environmental monitoring for these subprojects are not discussed here.

IV CONCLUSIONS

The EMPs for Gaizhou subproject were generally implemented during the construction period. The subproject was constructed in accordance with the national and local environmental procedures and guidelines, and the requirements of the EIAs. The adverse environmental impacts arising from the construction period were minimized by implementing relevant mitigation measures.

Appendix A: Environment Monitoring Location Map for Gaizhou Subproject



- a).Please provide contact information in Table 2-1 for GRM establishment;
- b).Section H addressed a workshop for training. Please provide more information, such as location, time, participants and etc.