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Environmental Management Plan

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List of Abbreviations

AIO	All in One
BBT	Ban Ban Tong
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
CNP	Construction Noise Permit
CPC	The Communist Party of China
CSO	Consulting Service Office
DPO	Development Policy Operation
EA	Environmental Assessment
EAO	Environmental assessment organization
ECOP	Environmental Codes of Practice
EMF	Environmental Management Framework
EMP	Environmental Management Plan
EMT	Environment management task
EP	Environmental Protection
EIA	Environmental Impact Assessment
EPD	Environmental Protection Department
ES	Environmental supervision
GDP	Gross Domestic Product
IFC	International Finance Corporation
PLC	Programmable Logic Controller
PMO	Project Management Office
PO	Project Owner
PRC	People’s Republic of China
SS	Site Specific Impact
SS	Suspended solids
TN	Total Nitrogen
TP	Total Phosphorus
WB	World Bank
WWTPs	Wastewater treatment plants

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Chapter I Project Introduction

1.1 Project Context

Despite the largest province for providing compulsory education, Guangdong Province is confronted with lots of challenges in the development of compulsory education. Firstly, the poor economic foundation and inadequate investment in compulsory education in underdeveloped areas of Guangdong Province resulted in such issues as unsatisfactory compulsory education facilities, poor overall quality of teaching staff and poor teaching quality; secondly, significant gap exists between areas and between urban and rural areas in Guangdong Province in respect of the development of compulsory education, and 16 counties, i.e. Chaoyang, Wengyuan, Wuhua, Haifeng, Lufeng, Suixi, Lianjiang, Leizhou, Wuchuan, Dianbai, Huazhou, Chao'an, Huilai, Puning, Jiexi and Luoding in the east, west and north of Guangdong (hereafter referred to as "weak counties of compulsory education") are the weakest areas of compulsory education in Guangdong Province due to the poor fiscal support, the extremely weak foundation of compulsory education, and the fact that the key indicators there are far behind the provincial average; secondly, Guangdong Province is facing great pressure in terms of fiscal budget for compulsory education - the average public expenditure per student in budget in the stage of compulsory education is below the national average, in which regard, Guangdong lags behind most provinces in China.

Guangdong Provincial CPC Committee and Government attach great importance to the balanced development of compulsory education, and actively promote the comprehensive reform of education system through implementation of relevant national regulations; promote educational development in undeveloped areas in the principle of "Strengthening, Taking the Leading and Raising Development Level"; promote the development of standard schools, establish sophisticated mechanism of sharing quality resources for compulsory education, and carry out supervisory

evaluation of balanced development of compulsory education; make rational allocation of teacher resources, and comprehensively improve the quality of rural teaching staff; increase provincial fiscal budget to underdeveloped areas and perfect the investment mechanism for balanced educational development. All these actions stimulated the balanced development of compulsory education in Guangdong Province, and made satisfactory achievements. However, the weak counties of compulsory education in Guangdong Province are still confronted with such problems as insufficient high-quality educational resources, some schools' failure to measure up to standards, backward education ideas and means, poor overall quality of teaching staff and inadequate compulsory education support for disadvantaged groups.

In the national background of "intensifying comprehensive educational reform", Guangdong Province proposed Guangdong Compulsory Education Project based on its actual conditions in the principle of "reform innovation, balanced development, overall coordination and focus on intelligence introduction" so as to better promote the balanced development of compulsory education in weak counties of compulsory education in Guangdong Province.

Under the personal guidance of provincial leaders, the Department of Education, the Development and Reform Commission and the Department of Finance etc. of Guangdong Province requested the Ministry of Finance and the National Development and Reform Commission to support the World Bank Loan-supported Guangdong Compulsory Education Project for several times in 2013, formulated the letter of intent based on comments from various parties, and submitted the project application report to relevant national departments concerned in December 2013. In October 2014, The Circular on Printing and Distribution of Application to National Development and Reform Commission and Ministry of Finance for Alternative Project Planning of Fiscal Years 2015-2017 of the World Bank Loan (DRC FI No. [2014]2284) included this project in the list of alternative planned projects for fiscal

years 2015-2017 of World Bank Loan (addition to the planning for the present period).

The proposed locations of this project involve 16 counties (cities/districts) in Guangdong Province, i.e. Chaoyang District, Wengyuan County, Wuhu County, Haifeng County, Lufeng County, Suixi County, Lianjiang City, Leizhou City, Wuchuan City, Dianbai District, Huazhou City, Chao'an District, Huilai County, Puning City, Jiexi County, and Luoding City. The 8 subprojects also have 22 items, which can be divided into the "hardware items" mainly engaged in capital construction and equipment procurement and the "software items" which is aiming at promoting the compulsory education connotation development in accordance with the project natures. Among the 22 subprojects, the 5 "hardware items" mainly include the "Ban Ban Tong (BAN BAN TONG (BBT))" teaching platform and maintenance of quality education resources, online classroom teaching stations and its maintenance, standardized classrooms, standardized mobile laboratories and Teacher turnover dormitories in the remote rural areas, and the remaining 17 ones are the "software items". Environmental management plan of this project includes standardized classrooms, standard mobile laboratories, and teacher temporary dormitories in poor remote rural areas. 250 standardized classrooms, 4 standard mobile laboratories and 5200 teacher temporary dormitories in poor remote rural areas were proposed. The locations and quantity are shown in Table 1-1 below:

Table 1-1 Locations and quantity of EMP

No.	Location	Standard classroom (per unit)	Standard mobile laboratories (per unit)	Teacher temporary dormitories in poor remote rural areas (per unit)
1	Wengyuan County	/	1	61
2	Haifeng County	15	1	240
3	Lufeng County	18	1	440
4	Huilai County	20	1	300
5	Puning City	12	1	770
6	Jiexi County	32	1	64
7	Chaoyang County	48	1	112
8	Chao'an District	12	1	240
9	Wuhua County	20	1	320
10	Luoding City	/	1	300
11	Dianbai District	15	1	382
12	Wuchuan City	16	1	267
13	Huazhou City	/	1	507
14	Lianjiang City	12	1	434
15	Suixi County	10	1	347
16	Leizhou City	20	1	416
17	Total	250	16	5200

Fig. 1-1 Locations of project implementation

1.2 Purpose of Environmental Management Plan

According to the consensus reached between the World Bank team and the Department of Education of Guangdong Province, no comprehensive environmental impact assessment is required for this project, but the World Bank is focused more on an integrated and practical environmental management plan (EMP).

In order to eliminate or offset adverse effects on environment and society during project implementation and reduce it to an acceptable level, before launching the project, we need to put forward a relief program which is reliable technically, workable economically and applies to project design period, construction period and operation period, a monitoring plan and an institution construction measures and implementation plan (that is EMP) as a part of the whole project management.

The purpose of developing EMP is to improve project screen, site selection, planning, design and implementation by formulating workable measures which will prevent, reduce or offset unfavorable environmental effects and increase favorable ones, take measures during project implementation to relief and manage those unfavorable environmental effects, evaluate actual results of relief measures by environment monitoring plan, and propose further relief measures according to the monitoring results.

Therefore, the purposes of this project EMP mainly are:

1. Make qualitative analysis and evaluation on current natural environment and social economic conditions in project area, and determine scope and extent which affect evaluation, review design and implementation of project environment protection plan;
2. Make comments on positive environmental effect caused by this project, identify, screen and predict possible negative influences;

3. Come up with targeted and effective control measures on unavoidable negative environmental effect;

4. Formulate relevant requirement to make sure these measures will be implemented timely and efficiently;

5. Evaluate actual effect of mitigation measures by implementing environmental monitoring plan.

1.3 Composing of EMP

According to WB Operation Manual-Environmental Assessment OP4.01, degree and scope of influence on environment caused by proposed project and environment sensibility in project area, environmental impact evaluation is classified into three categories, see Table 1-2.

Table 1-1 Project Environmental Impact Assessment (EIA) Classification

Evaluation category	Environmental effect	Evaluation content
Category A	Project that may exert negative influence on the environment.	This project requires comprehensive EIA.
Category B	Project that has limited negative influence on the environment and the influence can be reduced by adopting advanced technologies and mature preventive measures as regulated.	This project requires no all-sided EIA, but special environmental impact evaluation or analysis should be conducted based on characteristics of project and environment.
Category C	Project that has no or little negative influence on the environment.	Such project does not need environmental impact evaluation or analysis, only environment protection management records are required.

According to on-the-spot investigation carried out by WB environment experts, provincial project management office and project environment assessment team, the project coverage area has no ecological sensitive zone or fragile zone, or zones that require special protection or social concern. Based on nature, scale and impact of this

project as well as environmental features in local area, this project has short-term, non-distinctive and reversible environmental influence on the surroundings, it falls into category B. This is consistent with WB's relevant documents.

This report is composed of Environmental Codes of Practice (ECOP),site specific impact(SS) and Environmental Management Framework (EMF).

Chapter II Policies, Laws and Regulations and Basis of Compilation

In accordance with Notice on Strengthening EIA on International Finance Corporation Loan Project, Guangdong Compulsory Education Project Loaned by WB must observe the laws, regulations and standards of Environmental Protection (EP) in China and carry out environment impact assessment system. Based on the premise that environment impact assessment in China is conducted, International Finance Corporation (IFC) technical requirement must also be taken into consideration.

2.1 Environmental Policies and Regulations Documents

2.1.1 Relevant National Laws & Regulations

(1) Environmental Protection Law of the People's Republic of China (January 1, 2015);
(2) PRC Environmental Impact Assessment Law (September 1, 2003);
(3) Water Law of the People's Republic of China (October 1, 2002);
(4) Water Pollution Prevention and Control Law of the People’s Republic of China (PRC) (June 1, 2008);
(5) Detailed Rules for the Implementation of the Water Pollution Prevention and Control Law of PRC (March 20, 2000);
(6) Law of the Peoples Republic of China on the Prevention and Control of Atmospheric Pollution (September 1, 2000);
(7) Law of the People's Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste (April 1, 2005);
(8) Law of the Peoples Republic of China on the Prevention and Control of Environmental Noise (March 1, 1997);
(9) Law of the People's Republic of China on Water and Soil Conservation (March 1, 2011);

(10) Law of the Peoples Republic of China on Protection of Cultural Relics (October 2002);

(11) Regulations on the Administration of Construction Project Environmental Protection of the People's Republic of China (November 1998);

(12) Notice of the State Council on Printing and Issuing the "Twelfth Five-Year Plan" on Energy Saving and Emission Reduction Comprehensive Work (the State Council [2011] No. 26)

(13) Notice of Further Strengthening on Environmental Protection Management for Construction Project (State Environmental Protection Administration, EI No. (2001)19);

(14) Notice of State Environmental Protection Administration on Printing and Issuing the Temporary Act of Environmental Impact Assessment of Public Participating (State Environmental Protection Administration document, EI No. [2006]28).

2.1.2 Regulations of Local Government

(1) Guangdong Provincial Environmental Protection Regulations (January 1, 2005);

(2) Guangdong Provincial Environmental Protection Administration Regulations for Construction Projects (the fourth amendment, July 26, 2012);

(3) Guangdong Provincial Environmental Protection Management Specification for Construction Projects (trial) (Department of Environmental Protection of Guangdong Province, GES No. (2000) 8);

(4) Notice of Strengthening on Environmental Protection Management for Construction Projects (General Office of Guangdong Provincial People's Government, GGG No. (1999) 27);

(5) Environmental Function Zoning of Surface Water in Guangdong Province (GGC No. [2011] 29);

(6) Regulations of Guangdong Province for Control of Solid Wastes-induced Environmental Pollution (put in force on May 1, 2004);

(7) Notice on Printing and Issuing of the Implementation Opinions on Public Participation in Environmental Protection Management of Construction Projects in Guangdong Province (GE No. (2007) 99);

(8) Supplementary Administrative Opinions of Department of Environmental Protection of Guangdong Province on Public Participation in EIA of Construction Projects (EIAO No. [2011] 5);

(9) Management Ordinance of Guangdong Province for Municipal Wastes (November 7, 2005);

(10) Measures of Guangdong Province for Implementing Law of the People's Republic of China on Environmental Noise Control (July 23, 2010);

(11) Circular of Department of Environmental Protection of Guangdong Province on Further Enhancement of Public Participation and Government Information Publicity Extent for EIA, GEC No. [2012] 883.

2.1.3 Technical guidelines

(1) Technical guidelines for EIA General program (HJ2.1-2011);

(2) Guidelines for Environmental Impact Assessment Atmospheric Environment (HJ2.2-2008);

(3) Technical guidelines for EIA Surface water environment (HJ/T2.3-1993);

(4) Technical Guidelines for Noise Impact Assessment (HJ2.4-2009) ;

(5) Integrated Wastewater Discharge Standard (GB8978-1996);

(6) Discharge Limits of Water Pollution in Guangdong Province (DB44/26-2001);

(7) Code for Comprehensive Control of Water and Soil Conservation (GB/T16453.1-16453.6-1996);

(8) Technical Specifications For Regionalizing Environmental Noise Function (GB/T 15190-2014).

2.1.4 Relevant standards

(1) Environmental quality standards for surface water (GB3838-2002);

(2) Ambient air quality standards (GB3095-2012);

(3) Environmental quality standard for noise (GB3096-2008);

(4) Integrated wastewater discharge standard (GB8978-1996);

(5) Integrated emission standard of air pollutants (GB16297-1996);

(6) Emission standard of environment noise for boundary of construction site (GB12523-2011);

(7) Emission Standard for Community Noise (GB 22337-2008);

(8) Standards for pollution control on the storage and disposal site for general industrial solid wastes (GB18599-2001);

(9) Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002).

2.1.5 World Bank's Safeguard Policies and Guidelines for Environment, Health and Safety

WB's safeguard policies are to give consideration to social and environmental impact brought by projects invested by WB, including analysis of potential impacts and measures to mitigate the negative influences. It can not only avoid the damage to environment or human, but also perfect project design, improve work efficiency as well as protect reputation of WB and borrower.

Safeguard policies related to this project are shown as below:

(1) World Bank Operation Manual-Environmental Assessment OP 4.01;

(2) Environment, Health and Safety Guidelines for Water and Hygienic Conditions (IFC);

(3) Environment, Health and Safety Guidelines for Waste Management Facilities (IFC).

2.1.6 Project-related Documents

(1) Feasibility Study Report on World Bank Loan Guangdong Compulsory Education Project.

2.2 Effluent Standard of Pollutions

2.2.1 Standard for Water Pollutants Discharge

The laboratory wastewater will be discharged to wastewater treatment plants (WWTPs) by standardized mobile laboratory. And wastewater quality will be subject to grade-I B standard source as Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002); see Table 2-1 for details.

Table2-1 Standard limiting values of wastewater discharge for subject (Extract)

Pollutants	pH	COD	BOD5	SS	Animals and plants oil	Petroleum	Ammonia nitrogen	Anionic surfactants
Limiting Values	6~9	⩽ 60mg/L	⩽ 20mg/L	⩽ 20mg/L	⩽ 3mg/L	⩽3mg/L	⩽8mg/ L	⩽1mg/L

2.2.2 Atmospheric Pollutants Emission Standard

After the project is completed, it will bring about relatively low impact on ambient air quality. The main source of air pollution is malodorous gas from toilet (public toilet), of which the emission is subject to grade-II standard for factory boundary construction, expansion and reconstruction of fugitive emission source as per Emission Standard for Odor Pollutants (GB14554-93); see Table 2-2 for details.

Table 2-2 Standard for environmental air pollutants emission

Source of waste gas	Emission method	Altitude of emission (m)	Pollutant	Emission concentration limit (mg/m^3)	Standard
Public toilet	Fugitive emission	/	Odor concentration	20 (non-dimensional)	Grade-II standard for factory boundary construction, expansion and reconstruction of fugitive emission source as per Emission Standard for Odor Pollutants (GB14554-93)
			Hydrogen sulfide	0.06mg/m^3	
			Ammonia gas	1.5mg/m^3	

2.2.3 Noise Emission Standard

The construction noise produced during the development of this project must comply with the Standard for Ambient Noise Emission at Building Construction Boundary (GB 12523-2011). See Table 2-3 for details.

Table 2-3 Standard for ambient noise emission at building construction boundary (GB 12523-2011) Unit: dB(A)

Daytime	Nighttime
70	55

2.2.4 Solid Wastes Control Standard

1) Urban construction wastes shall be disposed of as per Decree No. 139 (2005) of the Ministry of Construction, i.e. the Provisions on the Administration of Urban Construction Garbage;

2) Implementation Measures for Administrative Licensing of Waste Disposal in Guangdong Province (Decree No. 135 of Guangdong Provincial People's Government on May 1, 2009).

Chapter III Project Content

3.1 Overview of the project area

3.1.1 Overview of Guangdong Province

Located in southernmost China, Guangdong is adjacent to Fujian in the east, Jiangxi and Hunan in the north, Guangxi in the west and South Sea in the south. The east and west sides of the Pearl River Estuary are respectively bordering Hong Kong and Macao, while the Leizhou Peninsula in the west is separated from the Hainan Province by the Qiongzhou Strait. With a land area of 179,700 km^2, it accounts for about 1.87% of the national land area. Guangdong is located in the monsoon region in the East Asia with respective mid-subtropical, south subtropical and tropical climate from north to south. It is one of the areas with the most abundant sunlight, heat and water resources throughout China. The annual average sunshine duration are 1745.8 hours and the annual average temperature is 22.3℃. With abundant precipitation, the annual average precipitation is between 1300~2500 mm and the provincial average precipitation is 1,777mm. The geographic distribution of precipitation is high in the south and low in the north. The annual distribution of precipitation is uneven, and the precipitation from April to September, namely the rainy season, accounts for over 80% of the total precipitation. With a large variation throughout the year, the precipitation in rainy years is 2 times of that in drought years. Flood, drought and typhoon occur frequently. The low temperature, cloudy and rainy temperature in spring, low temperature damage in autumn and cold-air outbreak and frost in late autumn and early spring are also frequent disastrous weathers in Guangdong Province.

Guangdong Province has diversified landforms including mountains, hills, tablelands and plains accounting for 33.7%, 24.9%, 14.2% and 21.7% of the total provincial area respectively, while the area of rivers and lakes only accounts for 5.5%. As for its

topography, it is high in the north and low in the south with mountains and high hills in the north and plains and tablelands in the south. The Province's mountain ranges run in a northeast-southwest direction similar to the geologic structure. As for plains, the largest one is the Pearl River Delta Plain, followed by the Chaoshan Plain.

In 2012, the permanent resident population of Guangdong was 105.94 million, which was the largest among provinces in China. As for compulsory education, there are 16,705 schools including 15,148 primary schools and 3,309 junior high schools, 12.507 million students including 8.082 million pupils and 4.425 million junior high school students, and 705,000 teachers including 432,000 primary school teachers and 273,000 junior high school teachers.

In 2012, the floating population in Guangdong Province was more than 30 million including 3.006 million students of compulsory education, which increased by 1.026 million compared with 2008 with an increase of 52%. It accounted for 24% of the provincial students of compulsory education and 21.6% of national floating students of compulsory education, which was also the total of that in Beijing, Shanghai, Tianjin, Jiangsu and Zhejiang. Among the floating students of compulsory education, there were 1.614 million moving in with parents from other provinces, accounting for 54% of the total number of floating children. In addition, there are also 995,900 left-behind children for compulsory education in rural areas throughout the province.

3.1.2 Overview of underdeveloped areas

3.1.2.1 Basic information

1. Wengyuan County

Wengyuan County is located in the north of Guangdong Province (Northern Guangdong), the southeast of Shaoguan City and the upstream of the Wengjiang River, the tributary of the Beijiang River. It is adjacent to Lianping County in the east,

Xinfeng County in the south, Yingde City and Qujiang District in the west, and Shixing County and Jiangxi Province in the north. The landforms of Wengyuan County are mainly mountains and basins. With a tropical monsoon climate, the average temperature is 20.4℃, the annual precipitation is 1,778mm and the frost-free period has 312 days. The agricultural acreage is 19,000 hectares, the forest land is 163,000 hectares, and the forest coverage rate is 63.1%. As for rivers, there are the Wengjiang River, the tributary of the Beijiang River, and its tributaries. The theoretical reserve of water power resources is 138,000KW. It has abundant mineral resources including coal, iron, lead, zinc and tungsten. As for scenic spots, it has Donghua Mountain, Shuilong Palace, Xianshi Cave, Shutang Stone, Hakka Buildings in Central Lake, Ximao Ridge and Bagua Village. The crops there are mainly rice, vegetables, sugarcanes, peanuts and soybeans. Fruits such as Sanhua plum, Liuli orange and Jiuxian peach have long enjoyed a good reputation, therefore it is also known as the "village of Sanhua plum", the "village of Jiuxian peach" and the "village of orchids" in China. There are mainly Han people, Yao people, Zhuang people and people of other minorities living there. According to the fifth population census in 2000, the population of the county was 310,956, including 308,749 Han people, accounting for 99.29% of the total population in the county, and 2,207 minority people, accounting for 0.71% of the total population in the county. Except for Yao nationality, other minorities lived in Wengyuan due to their job or marriage after liberation.

2. Haifeng County

Located in the southeast of Guangdong coast, Haifeng is adjacent to Lufeng County in the east and Huidong County and Zijin County in the northwest. It is against Lianhua Mountain in the north and the South Sea in the south. The geographical coordinates are 114°54′~115°37′E and 22°37′~23°14′N. The county government is in Haicheng Town. As for highway, it is 290km away from Guangzhou, 197km away from Shenzhen, 177km from Shantou and 227km away from Hong Kong. As for waterway, it is 81 sea miles (150km) from Shanwei Port to Hong Kong and 179 sea miles

(332km) from Guangzhou. Located in the south margin of the Tropic of Cancer, Haifeng County is in the subtropical climatic region with obvious oceanic climates featured by pleasant temperature, abundant precipitation and adequate light and heat. With a long summer, it has high temperature, frequent rainfall and high humidity and southwester prevails there, therefore meteorological disasters like flood and typhoon occur frequently; while with a short winter, it is slightly cold and dry with few rainfall and frost and no snow. In early summer and late autumn, the temperature is suitable for the growth of crops. Leaves are green all the year round. The vegetation in the county belongs to evergreen forest in south subtropical monsoon region. As for natural vegetation, there is the broad-leaved forest, coniferous forest, shrub vegetation, grass and marsh and aquatic vegetation. As for artificial vegetation, there is the agricultural vegetation, fruit-bearing forest, timber forest, bamboo forest and coast protection forest. As for categories, there is the evergreen broad-leaved forest, deciduous broad-leaved forest, coniferous forest, shrubby bamboo vegetation (Mountainous common bamboo, broom bamboo, sweet bamboo, Fengjing bamboo, bitter bamboo and dianthus), herbosa, vine vegetation, meadow vegetation, marsh vegetation and aquatic vegetation.

3. Lufeng City

Lufeng County was changed into Lufeng City (county-level city) in 1995. Located in Jieshi Bay, southeast Shanwei, Guangdong, China, it is adjacent to Luhe County and Puning City in the north and Huilai County in the east. With the geographical coordinates of 115°25′-116°13′E and 22°45′-23°09′N, it is adjacent to Luhe County and Puning City in the north, Huilai County in the east, Haifeng County and Shanwei City in the west and the South Sea, Hong Kong and Macao in the south. It is located between Shenzhen and Shantou with a land area of 1,681km^2 which accounts for 31.89% of the land area of Shanwei. With a sea area of 12,600km^2, the coastline is 116.5km long. The terrain of Lufeng inclines from north to south. The highest point is located in the Emei Mountain Peak which is the northwest of Piyang Town with an altitude of 980.3m; while the lowest point is located in the south of Haizai Village,

Donghai Town, Central Lufeng with an altitude of 0.1m. Therefore, the vertical height from the lowest to the highest is 980.2m. From north to south, there are respectively mountains, hills and plains (coastal platform). Up to 2005, Lufeng city governed 17 towns, 3 sub-district offices, Tongluo Lake Farm, Da'an Farm and Xingdu Economic Development Experimental Zone.

4. Huilai County

Located in the southeast coast of Guangdong Province and the south of Chaoshan Plain in East Guangdong, Huilai County is adjacent to Shantou City (Chaonan District) in the east, Shanwei City (Lufeng City) in the west and the South China Sea in the south. The Shenquan Port which is a national first-class port is 216 sea miles away from Kaohsiung in Taiwan. Huilai County is also adjacent to Jieyang City (Puning City) in the north, and it is also the only coastal county and maritime traffic portal of Jieyang City with a sea area of 7,689km^2 and a coastal line of 109km. In December 2006, Huilai County was named as the "County of National Energy and Industry". It has abundant precipitation but with unbalanced distribution. The period from May to August is the rainy season, and the precipitation accounts for 88% of the annual precipitation. Therefore, flood is frequent at the end of spring and the beginning of summer. Located in the south of the Tropic of Cancer, it is the south subtropical monsoon climate with high temperature and humidity, abundant precipitation and adequate sunshine. With an annual average temperature of 21.8℃, the hottest month is July with an average temperature of 28℃ and an extreme high temperature of 38.4℃; while the coldest month is January with an average temperature of 14.1℃ and an extreme low temperature of 2.1℃. The annual average sunshine rate is 46% and the average solar radiation intensity is 126 calorie/cm^2. With an annual average precipitation of 1,829mm, it is rainy in summer and autumn while dry in winter and spring.

5. Puning City

Puning City is a medium rising city located in the west margin of Chaoshan Plain that is in the southeast of Guangdong Province. It is adjacent to Rongcheng District and separated with Jiedong District by a river, Huilai County in the south, Jiexi County in the west, Chaonan District of Shantou City in the east and Shanwei City and Lufeng City in the southwest. It has Rongjiang River, Lianjiang River and Longjiang River in the city. The mountains in the city are offsets of Lianhua Mountain spreading to the southwest. The longest distance from east to west is 50km, the longest distance from south to north is 38km, and the perimeter of the city boundary line is 206km. The total area of the city is 1,620km^2, namely 2.43 million mu including a cultivated land area of 384,000mu accounting for 15.8% and a mountainous area (forestry land, Qiaochang not included) of 1,447,000mu accounting for 59.6%. The municipal planning control area is 220km^2 and the built-up area is 26km^2. Except for some rural areas in the north, Puning City is located in the south of the Tropic of Cancer, which is the humid south subtropical monsoon climate with an annual average temperature of 21.3℃ and an annual average precipitation of 2,124mm.

6. Jiexi County

As a governed county by Guangdong Jieyang City, Jiexi County gets its name for its location in the west of Jieyang City (prefecture-level city) for “Jiexi” is the abbreviation of “the west of Jieyang”. Located in the northwest of Chaoshan Plain, the middle and upper reaches of Nanhe River of Rongjiang River and the southwest of Shantou City, Jiexi County is adjacent to Lancheng District of Jieyang City, Puning City in the south, Luhe County of Shanwei County in the west, Wuhua County of Meizhou City in the northwest and Fengshun County of Meizhou City in theh north. With a subtropical monsoon climate, Jiexi County has a long summer and a short autumn, where the summer is hot and rainy and the winter is cold and dry. The weather in spring is cold, cloudy and rainy while the weather in summer is hot and rainy. According to the statistics of the Meteorological Department, in 1967-2003, the average temperature in summer is over 24℃ and the average highest temperature in

July reaches 28.2℃. With abundant precipitation in summer, the peak season of precipitation is from late May to early June and late July to early August with an average 10-day precipitation of 119.5mm. The winter is cold and dry with a perennial average temperature of 13.4℃ in January and an average precipitation of 37.3mm, therefore winter drought is frequent.

7. Chaoyang District

Governed by Guangdong Shantou, Chaoyang District gets its name for its location in the north of the sea. Located in the southeast of Guangdong Province, it borders on the South Sea. It is adjacent to Haojiang District in the east and separated with Jinping District by the Niu Tian Yang in the northeast. It is adjacent to Puning City in the west, Chaonan District in the south, and Jieyang City in the north. Lianjiang River, the mother river, passes Chaoyang District from west to east and enters into the South Sea in Haimen Town. Being close to the Tropic of Cancer, Chaoyang District has subtropical oceanic climate with an annual average temperature of 21.5℃, an annual average precipitation of 1,721mm and an annual average humidity of 80% (1959-2007). The period from July to September is influenced by typhoon. As for vegetation, there are arbors, shrubs, coniferous forest and broad-leaved forest. There are over 100 crops, and the most famous fruit trees are Wusu Waxberry in Xilu Town, trigone olive, and lion-headed emblic leaf flower in Gurao Town. In addition, Chaoyang ginger potato is also the specialty of Chaoyang District. It has about 20 kinds of domesticated animal and over 60 kinds of common wild animals. It has about 220 kinds of marine and freshwater fishes including over 100 kinds of major commercial fishes.

8. Chao'an District

Chao'an District is located in the east of Guangdong Province and the middle and downstream area of Hanjiang River. The Hanjniang River passes through 96km from south to north of the district, connecting Shantou Special Economic Zone in the south. Being about 10km away from Shantou Port and Shantou Airport, the district is located

in the “Golden Triangle” zone of Shantou, Chaozhou and Jieyang. Chao’an District governs 16 towns and 1 national farm including a cultivated area of 313,000mu and a mountainous and hill area of 1.1 million mu. It sets 461 administrative villages and 28 community residents committees with a total area of 1065.92km^2. Under the governance of Chao’an District, there are 392 administrative villages and 26 communities’ residents’ committees. The total population in 2013 was 1.004 million. Chao’an is a famous hometown for overseas Chinese, and there are about 0.7 million Chao’an people living in foreign countries, Hong Kong, Macao and Taiwan. Chao’an is in the subtropical area with abundant precipitation, moderate climate, fertile land, evergreen trees and an annual average daily temperature of 21.4℃. Since the restoration of organizational system, Wanfeng Forest Natural Reserve Area and Marine Abrasion Landform Natural Reserve Area in Merlin Lake have become provincial forest ecology natural reserve areas.

9. Wuhua County

Renamed from Changle County at the beginning of the Republic of China, Wuhua County is governed by Meizhou City, Guangdong. As a revolutionary base area, it is located in the northeast of Guangdong Province and the upper reach of Hanjing River. As a part of the hilly land in East Guangdong, it is in 3°23'~24°12'N and 115°18'~116°02'E, starting from Zhaoyue Ridge in Guohua Town in the east to Chicken Heart-shaped Stone in Changbu Town in the west and from Longshi Palace in Dengshe Town in the south to Yang Tang Wei in Xinqiao Town in the north. It is adjacent to Fengshun County, Jiexi County and Luhe River in the southeast, Heyuan City and Zijin County in the southwest, Longchuan in the northwest and Xingning in the northeast. It is 71.59km from east to west and 87.99km from south to north. The landform of the county is a rhombus with a total area of 3,226.06km^2 which accounts for 1.47% of that of Guangdong Province, and it is high in the southwest and low in the northeast. The annual average temperature is 20℃ and the annual average precipitation is 1500mm. With a developed river system, there is mainly the Qinjiang River, Wuhua River and Meijiang River in the county. The

Guangzhou-Meizhou-Shantou Railway and the National and Provincial Highway 205 also pass through the county.

10. Luoding City

As a county-level city governed by Guangdong Province, Luoding City is governed by Yunfu City, a prefecture-level city. It is located in the west of Guangdong Province in 22°25′11″～22°57′34 ″N and 111°03′08″～111°52′44″E. Being adjacent to Yun'an County in the east, Yangchun City in the southeast, Xinyi City in the southwest, Yunan County in the northeast and Cenxi City of Guangxi Province in the west, it is an important portal for Guangdong and the southwest part of China. It was once an important military town to guard the Southwest Ridge of Guangdong, known as "a place as important as the door and courtyard needing strong defense". Governing 21 towns, the municipal government is located in Luocheng which is 246km away from Guangzhou. Located in the south of the Tropic of Cancer, Luoding is in the south subtropical monsoon climate area with a long summer and no severe winter. It has relatively high temperature, abundant heat, warm spring and autumn, large precipitation variation and obvious regional difference in temperature, light and heat. Therefore, disasters such as drought and late spring coldness are frequent. The annual average sunshine rate is 42% with an average temperature range of 18.30～22.10℃. The cumulative annual precipitation is 1260～1600mm with an average value of 1400mm. The gross reserves of underground water in Luoding City is 360 million m^3 while surface water is mainly in the Luoding River (known also as Longjiang River and Nanjing River) and its tributaries, among which the drainage area of 11 secondary and tertiary tributaries is over 100km^2. With multiple mountain streams and large falls, the exploitable hydropower is 62,700KW. Starting from Jilong Mountain in Xinyi City, the Luoding River passes through 11 villages and town of Luoding City and enters the Xijiang River through the Nanjiang River Estuary in Yunan County.

11. Dianbai District

Governed by Maoming City of Guangdong Province, Dianbai District is located in the southwest coast of Guangdong. It is adjacent to Gaozhou and Yangchun in the north,

Maonan District and Wuchuan in the west, and the South Sea in the south. Established in April 18, 2014, it is merged by the former Dianbai County and the Maogang District of Maoming City. Dianbai District is the only coastal county-level administrative district governed by Maoming City and its coastal area is an important part of the Guangdong-Maoming Coastal New Area (starting from Diancheng Town and Bohe Town). Qijing Town is governed by Maoming High-tech Industrial Development Zone (known also as Maoming High-tech Zone, a planning part of the Coastal New Area). Nanhai Street is in the Shuidong Bay New District. Being in low latitude areas in the south of the Tropic of Cancer, Dianbai District is in subtropical monsoon climate area with warm temperature, adequate sunshine, abundant precipitation, synchronous rain and heat, few frosts, no snow and spring-like seasons. The annual average sunshine hours are 2,161 with a sunshine rate of 40-49%. July and October are the months with the longest sunshine hours while February and March are with the shortest. The perennial average temperature is 23℃ with an inter-annual variation of 22.4℃-23.7℃. The hottest month is July with a monthly average temperature of 28.5℃ while the coldest is January with a monthly average temperature of 15.68℃.

12. Wuchuan City

As a coastal city and with 3 rivers passing through, Wuchuan City has a developed water system, adequate sunshine, pleasant climate and rich resources and is a livable city with Jianghai cultural features. Located in the southwest of Guangdong Province, Wuchuna City is faced with the South Sea. The total area is 848km^2 and the total population is 1.01 million (2003). It has adequate sunshine and rich heat resource. According to statistics (1963~2000) of the Meteorological Department, the perennial average sunshine hours are 2008.2 and the sunshine rate is 45% while the annual average temperature is 22.8℃. The average temperature in January, the coldest month, is 15.7℃ while the average temperature in July, the hottest month, is 28℃. With abundant precipitation and unbalanced distribution, the average relative humidity is 85%. Being located in low altitude area and faced with the South Sea, it is frequently

influenced by typhoon from the Western Pacific and the South Sea. According to the statistics of the Meteorological Department, it is averagely influenced by 3 or 4 typhoons every year from May to November, and the worst months are July, August and September.

13. Huazhou City

Huazhou City is located in the southwest of Guangdong Province and the middle reach of Jianjiang River with the geographic coordinates of 110°21′～110°45′E and 21°29′～22°13′N. With a distance of 80km from south to north and a total area of 2354km^2, it is narrow and long in landform, looking like a sitting lion and inclining from north to south. It has a cultivated land area of 659,000mu, a forest area of 1.61 million mu, an orchard area of 900,000mu and a freshwater fishpond area of 100,000mu. It is in subtropical area with warm climate, abundant precipitation, fertile land and favorable geographical environment. As one of the national famous south-north vegetable transmission bases, it borders on Beiliu County of Guangxi Province in the north, Wuchuan City of Guangdong Province in the south, Gaozhou City and Maonan District of Maoming City in the east and Luchuan County of Guangxi Province and Lianjiang City of Guangdong Province in the west. It has rich mineral resource. According to primary exploration, there are over 20 kinds of metal and non-metal ores including titanium, kaolin, white stones, pyrite, aluminum and zinc, gold, copper, manganese, micalex, limestone, granite, potassium feldspar and other resources, among which the titanium reserve ranks forefront in China.

14. Lianjiang City

Lianjiang City is a county-level city governed by Guangdong Province. Located in the southwest of Guangdong Province and the north of Leizhou Peninsula, it borders on Guangxi and Beibu Gulf with a total area of 2835 km^2. The geographic coordinates are 21°25′～21°55′N and 109°45′～110°30′E. It has a moderate climate with an annual average temperature of 22.7℃. With adequate light and heat resources and a subtropical monsoon climate, it is an opening area in coastal China. With beautiful

natural scenery, a south subtropical monsoon climate, adequate light, abundant precipitation, fertile land and spring-like seasons, it has rich natural resources. As for mineral resource, it has over 20 kinds, including gold, silver, aluminum, zinc, tin, antimony, granite, limestone, basalt stone, etc. and the reserves of silver and granite rank forefront in Guangdong. It has 1.53 million mu of mountains and hills that are suitable for forestry, fruits and animal husbandry. It has over 2,800 ponds and reservoirs with Jiuzhou River running 89km through the city, while the exploitable water area throughout the city is 160,000mu.

15. Suixi County

Located in the north of Leizhou Peninsula of South China, Suixi County is 16km away from Zhanjiang City which is the city of port in the east. It is separated with Hainan Island in the south and Beihai City of Guangxi in the west by a sea. It borders with Leizhou City in the south and the old Lianjiang City in the north. It is also the famous “First National Sweet County”. With a long coastline and multiple bays, Suixi County has rich marine products, wide land and rich products, evergreen seasons, warm winter and cool summer, pleasant climate and rich agricultural products. With a subtropical oceanic climate, high temperature and abundant precipitation, it can plant tropical and subtropical plants which cannot grow in other areas. Therefore, it becomes the production base of tropical and subtropical crops in Guangdong and China. It is also the treasure land for tropical crops with a good development prospect. In Suixi county, mineral resources including precious metals, metals and non-metals are found. As for precious metal, there is mainly the gold ore which is located in the Qiushui Ridge which is the boundary of urban and rural areas and around Wushe Ridge in Huanglue Town. There are 7 underground mineral veins with a length ranging from 1km to 4km and a depth of 40m.

16. Leizhou City

Located in the south of the Tropical of Cancer, Leizhou City is located in subtropical zone and faced with the South Sea. Known as Haikang County before it is a city, it is

a county-level city governed by Zhanjiang City of Guangdong Province and it is located in middle Leizhou Peninsula with a geographic coordinate of 109°42′12″~110°23′34″E and 20°26′08″~21°11′06″N. The registered population of Leizhou City is 1.7 million (2010) and the total area is 3,532km^2. It governs sub-district offices including Leicheng, Xihu and Xincheng and 18 towns and villages with a permanent resident population of 0.32 million (2010). The total cultivated area of the city is 1.62 million mu with a coastline of 406km. With a smooth terrain and low altitude, the landform there is mainly tableland, some low hills and small alluvial plain. With a humid subtropical monsoon climate, it has adequate light and rich heat. The annual average sunshine hours are 2,003.6 hours and the total annual radiation quantity is 108~117 calorie/cm^2. With an annual average temperature of 22℃, the highest temperature is 38.5℃ (June 8, 1977) and the lowest is 0℃ (December 2 and 29, 1975). The hottest month is July with an average temperature of 28.4℃ and the coldest month is January with an average temperature of 15.5℃.

3.1.2.2 General Information of Education

1. Counties of weak compulsory education are also of large population. In 2012, the permanent resident population in counties of weak compulsory education is 20.018 million, accounting for 18.90% of the provincial permanent population. There are 5,605 schools for compulsory education in counties of weak compulsory education, accounting for 33.55% of the provincial schools, 2.9701 million students, accounting for 23.75% of the total number of students for compulsory education, and 154,500 teachers, accounting for 21.88% of the total number of provincial teachers for compulsory education.

2. Counties of weak compulsory education are also of low per capita financial guarantee. In 2012, the GDP of counties of weak compulsory education was 0.33560753 trillion yuan, accounting for 5.88 of the provincial GDP. The general budget revenue of local finance was 12.341199 billion yuan, accounting for 1.98% of

the total provincial number. The fiscal expenditure was 43.117932 billion yuan, accounting for 5.93% of the provincial fiscal expenditure. The lowest per capita disposable revenue (according to the Ministry of Finance) is 47,300 yuan.

3.2 Main Problems of Education in Project Areas

3.2.1 Weak economic base in underdeveloped areas in Guangdong Province

In 2012, the GDP in Guangdong Province was 5706.792 billion yuan, ranking the 1st among Chinese provinces and cities. However, there are two 80% in Guangdong's entire economy. 80% of the economic aggregate of Guangdong is in the Pearl River Delta while 80% of the economic aggregate of the Pearl River Delta is in Guangzhou, Shenzhen, Foshan and Dongguan. The per capita GDP of 12 prefecture-level cities in East and Northwest Guangdong is lower than the national average, the GDP of 7 prefecture-level cities is still lower than 100 billion, and the fiscal revenue of 5 prefecture-level cities is less than 5 billion yuan. Due to the weak economic base in underdeveloped areas especially in some remote rural areas, local government has a very limited financial resource. Therefore, the investment in education especially compulsory education is not sufficient, causing problems such as imperfect educational infrastructures, overall low quality of teachers and low educational level in underdeveloped areas.

3.2.2 Existing Relatively Large Gap of the Development of Compulsory Education in Underdeveloped Areas in Guangdong

In recent years, Guangdong Province attaches great importance to promote the development balance of compulsory education, optimizes the educational investment structure, allocates educational resources rationally and focuses on rural areas, remote areas and underdeveloped areas and minority areas. The development balance of compulsory education achieves remarkable results, but there is still a big gap in the

development of compulsory education among various provincial areas and between urban and rural areas, especially in the 16 counties (cities and districts), namely Chaoyang, Wengyuan, Wuhua, Haifeng, Lufeng, Suixi, Lianjiang, Leizhou, Wuchuan, Dianbai, Huazhou, Chao'an, Huilai, Puning, Jiexi, Luoding, in East and Northwest Guangdong, the majority of which are with large population but with low level of financial security and weak basis for compulsory education. With a wide gap from provincial average in major indexes, they are areas with weak compulsory education basis in Guangdong Province.

3.2.3 Lack of Quality Educational Resources

Seen from a provincial scale, quality educational resources of our province are mainly in Pearl River Delta, large and middle cities. As for counties of weak compulsory education, quality educational resources are mainly concentrated in the county center and township areas. Counties of weak compulsory education have insufficient educational resources and uneven distribution. Coupled with the not-yet-established sharing system of quality educational resources among various areas and between urban and rural areas, it is difficult for counties of weak compulsory education to quickly expand quality educational resources and improve the overall educational level.

3.2.4 Some Schools Fail to Reach the Standard Requirements

First, there are insufficient enrollment seats in schools of compulsory education with the phenomenon of a large class quota. There are 2,163 classes in primary schools and 7,187 classes in junior schools with over 66 students, accounting respectively for 4.44% and 27.46% of the total number of classes in primary schools and junior schools in counties of weak compulsory education. Second, there are insufficient dormitories for teachers in remote rural areas. The accommodation for teachers in special position, supporting teachers, exchanging teachers and administrative teachers in boarding schools is poor, which cannot attract excellent teachers to teach and support in remote rural schools.

3.2.5 Backward Educational Concept and Means

First, the classroom teaching mode is old-fashioned. Due to the lack of advanced educational concept and means, the classroom teaching mode in counties of weak compulsory education is still traditionally dominated by teachers, adopting the cramming method of teaching, namely "with a blackboard and chalks, the teacher talks from the beginning to the end." Second, the launching rate of experimental teaching is low. Under the background of fast development of urbanization, the school scale of counties and villages with weak compulsory education decreases with insufficient teaching instruments and equipment and experiment teachers, therefore students have rare opportunities to practice.

3.2.6 Low Overall Level of Teachers

First, the educational background is low. The proportion of primary school teachers with junior college degree and above is 79.98% in counties of weak compulsory education, while the provincial proportion is 88.14%. The proportion of junior school teachers with college degree and above is 48.38% in counties of weak compulsory education, while the provincial proportion is 67.26%. Second, the proportion of senior professional post of teachers is low. The proportion of senior professional post of teachers in counties of weak compulsory education is 58.88%, while the provincial proportion is 62.88 %. Among junior school teachers, the proportion of the title of "senior middle school teachers" is 3.61%, while the provincial proportion is 8.15%.

3.2.7 Insufficient Educational Security of Special Groups

First, the care and service system for rural left-behind children is imperfect. Counties of weak compulsory education are also of large population and great labor transfer, leaving a large number of rural left-behind children. However, the working system, working mode and relevant systems to care left-behind children are not perfect yet, and the mental health of rural left-behind children needs urgent and intense attention. There are 356,200 rural left-behind children in counties of weak compulsory

education, accounting for 35.77% of the provincial rural left-behind children. Second, the service system of learning in regular class for special children is imperfect. The number of teaching resources and classrooms for special education in counties of weak compulsory education is small, ordinary schools that provide the service of learning in regular class cannot meet the special educational needs of disabled students, and the quality of learning in regular class needs to be improved.

3.2.8 Imperfect Educational Quality Management

There are problems such as free increase and decrease of classes and class hours, unreasonable flow of educational activities and imperfect evaluation standard of teaching quality and academic quality affecting the improvement and sustainable development of the quality of compulsory education.

3.3 Project Objective

In February 2013, the provincial government published the *Opinions of the People's Government of Guangdong Province on the Implementation of "Strengthening, Taking the Leading and Raising Development Level" in Guangdong's Education* (YF No. [2013]). It requires to take "Strengthening, Taking the Leading and Raising Development Level" as the goal to conduct deep reform, prior implementation, overall planning, step-by-step implementation, quality and strength pursuance, connotative development, classified instruction and integrating development, which will efficiently improve Guangdong's scientific development in education at a new starting-point. By 2020, it will achieve the provincial coverage of "Excellent Educational Counties (Cities and Districts) in Guangdong Province" and "Excellent Educational Cities in Guangdong Province", while the coverage rate of "Advanced Counties (Cities and Districts) of Educational Modernization in Guangdong Province" will reach 85%.

The project objective is that from 2016 to 2021, through 5 years' endeavor, we will achieve obvious breakthrough in the balanced development system of innovative compulsory education and the balanced development standard system of compulsory education, greatly improve the balanced development level of compulsory education in project counties (cities and districts), and provide experience of balanced development of compulsory education for Guangdong and China.

3.4 Construction content of the project

3.4.1 Construction content and scale of the project

The implementation content of the "World Bank Loan Guangdong Compulsory Education Project" contains 8 projects and 22 sub-projects., which can be divided into the "hardware items" mainly engaged in capital construction and equipment procurement and the "software items" which is aiming at promoting the compulsory education connotation development in accordance with the project natures. Environmental management plan of this project includes standardized classrooms, standard mobile laboratories, and teacher temporary dormitories in poor remote rural areas. See table 3-1 for specific project content.

Table 3-1 Table of construction and scale of the project

No.	Item	Quantity	Remark
1	Pilot project of school's standardization construction		
1)	Standardized classrooms	250 classrooms	Hardware facility
2)	Standard mobile laboratories	4 labs	Hardware facility
3)	Dormitory for teachers in remote and poor rural areas	5,200 rooms	Hardware facility

3.4.2 Construction details

The environmental management plan is to eliminate or compensate for the negative impact of the project on the environment and society in the implementation process, therefore the main focus is on the construction content of the project. In order to better

analyze the environmental impact of the project and propose effective mitigation measures, it is necessary to identify the construction details. It is summarized as follows：

3.4.2.1 Standardized classrooms

Combining with urban and rural population mobility, school-age population change and age features and growth law of students in counties of weak compulsory education and according to scientific planning and practical needs of counties of week compulsory education, the project plans to build some standardized classrooms in the counties (cities and districts) to alleviate the problems of "large class quota" in the counties (cities and districts). With a construction area of 100m^2 of each standard classroom, the construction content includes classroom building engineering, decoration engineering and installation (water supply and drainage, electricity, ventilation and weak current, etc.) engineering. The project builds 250 standardized classrooms in 17 project counties (cities and districts).

3.4.2.2 Construction of standardized mobile laboratory

As required by *Equipment Standard of Educational Instrument for Primary Mathematics and Science (JY/T0388-2006)* and *Equipment Standard of Educational Instrument for Junior High School Science (JY/T0386-2006)*, standardized mobile laboratory means to equip a coach with educational instrument and equipment, instructors, driver or transport vehicles to conduct touring experiment education activities in rural areas in order to solve the problem of the lack of experiment education in remote rural areas. The Provincial Project Management Office is responsible for bids invitation and supplier selection. Suppliers should construct and provide mobile laboratories as required. In the service stage of the equipment (within the project implementation), the Provincial Project Management Office is responsible for the operation, maintenance service and procurement of the laboratories, suppliers

are responsible for the operation and maintenance of mobile laboratories, including experiment teachers, transport vehicles and experiment material consumption, while the County (City and District) Office is responsible for bids invitation.

Standardized mobile laboratory involves 3 counties (cities and districts) of Guangdong Province, including Lufeng City, Chaoyang District and Dianbai District. The carrier of standard mobile is a coach with a length of 12m, a width of 2.55m, a height of 3.95m, a wheel base of 6.05m and no seats for passengers. As for equipment, it includes test stand, floor, water supply system, power supply system, air-conditioning system, ventilation system, escape system, video monitoring system and wastewater recovery system. Major equipment and parameters are shown in table 3-2.

Table 3-2 Major equipment and parameters table of standard mobile laboratories

No.	Major equipment	Technical parameters	Quantity
1	AIO computer	Processor: Intel I5 (CPU Clock Speed ≥3.2GHz) Hard disk ≥500G (7200 rpm) RAM: DDR3, ≥4G Display: 20 inch, LED LCD screen 1600 * 980 1000Mbps network card, wireless LAN card, Bluetooth 4.0 1 million pixels camera	13
2	Teaching control system	Achieving the function of classroom teaching (including attendance check, screen broadcast, classroom test, screen recording, homework receiving/sending, etc.); Supporting the playback of video of multiple file format and supporting HD videos	1 set
3	Data collector	Connectable to microscope to do bio-experiment Interactive and inquiry-based experiment platform Display ≥14cm	13 sets
4	Sound-level sensor	Sound level range: 30-70dB; 50-90dB; 70-110dB; Accuracy: up to ± 2dB at 94dB (1000Hz) Resolution: 0.1dB; Maximum sampling rate: 20Hz;	13 sets
5	Optical kit	Accessories of color mixer; color mixer; photo-sensor Range: 0 ~ 2.6 Lux (candles), 0 ~ 260 Lux (light	13 sets

No.	Major equipment	Technical parameters	Quantity
		bulbs), 0 ~ 26,000Lux (sun), Resolution: 1/10,000 full range; Maximum sampling rate: 1000Hz; Optical kit: 1 biconvex lens, biconcave lens, 1 ordinary lens, a glass screen, 2 mirrors, 3 supports, cellophane squares of different colors, 2 equilateral prisms, 1 medium-size beaker, 1 flashlight, 1 plastic screen and 1 candle Electric box kit for students: 1 interchangeable strip and 1 white plastic visor plate	
6	Ophthalmic optics	Human eye model, size: 15cm * 17cm * 10cm; Light source: Light bulb Type: G4 halogen, 12 V, 10 W; Input power (including power adapter): 100-240V, 50-60Hz; Optical measurement mirrors	13 sets
7	Electrical equipment	A voltage/current sensor Electrical experiment box DC Power Supply: adjustable output voltage, dual output, 0-5V, 0-15V micro-generator	13 sets
8	Magnetic field sensor	Range: ± 1000 Gauss, Accuracy: ± 3 Gauss or 5% of the reading; Resolution: <0.1% Gauss (0.01% at full range) Maximum sampling rate: 20Hz Repeatability: 0.05%	13 sets
9	Temperature sensor	Range: -35 ° c-135 ° c Accuracy: ± 0.5 ° c Resolution: 0.0025 ° c Repeatability: 0.1 ° c Maximum sampling rate: 10Hz	13 sets
10	Absolute pressure/ temperature sensor	Pressure range: 0-700kPa, Resolution: 0.1kPa, Repeatability: 1kPa; Temperature range: -10 ℃ -70 ℃, Resolution: 0.05 ℃.	13 sets
11	Thermal equipment	Radiation tank Energy conversion - solar energy, including: plastic box with lid, black aluminum (23cm * 6cm) with 10kΩ of thermal resistance, cable for the temperature sensor Four-port temperature sensor Range of stainless steel sensor: -35 ° C to + 135 ° C, Accuracy: ± 0.5 ° C; Rapid-response temperature Probe Measurement Range: -10 ° C to + 70 ° C, Accuracy: ± 0.5 ° C; Resolution: 0.0025 ° C;	13 sets

No.	Major equipment	Technical parameters	Quantity
		Maximum sampling rate: 100Hz; Thermal work equivalent tube, including: thermal power equivalent pipe (70cm long and 4cm in diameter), built-in fast-response thermistor probe, metal balls (60)	
12	Doppler rocket	Doppler rockets, rope (30m long), handle (4), handle pad (4), battery (9V)	13 sets
13	Oxygen sensor	Range: 0-100%, Oxygen concentration, 0 - 1,000,000ppm, Resolution: 0.024%, Repeatability: ± 0.5%; Accuracy: ± 1% at room temperature, ± 5% when above operating temperature range; Operating temperature: 0-40 ℃;	13 sets
14	Carbon dioxide sensor	Range: 0-300,000ppm, Resolution: 1ppm; Operating temperature: 20-30 ℃; Accuracy: taking the larger between 100 ppm or 10% of the measured value when in the range of 0 to 10,000 ppm; 20% of the measured value when in the range of 10,000 to 50,000 ppm; Maximum sampling rate: 10Hz; Ecological zones system includes: 3 separate ecosystem pots (with lids), various plugs for different sensors	13 sets
15	Dissolved oxygen sensor	Range: 0 to 20mg / L, Resolution: 0.01 mg / L. Maximum sampling: 20HZ Containing a spare film; Operating range: 0-50 ℃ ;Accuracy after calibration is ± 0.2mg / L;	13 sets
16	Salinity sensor	Maximum sampling rate: 50Hz; Temperature: ± 0.5ppt 0 ° c-45 ° c Measuring range: Conductivity: 1,000-100,000us, Temperature: 0-50 ° c; Salinity: 1-55ppt ± 1%	13 sets
17	PH sensor	Temperature range: -35 ° C to +135 ° C, Accuracy: ± 0.5 ° C, Resolution: 0.01 ° C or higher; Light: 3 ranges including 100 lux, 10000 lux and 150,000 lux for users to choose Spectral sensitivity: 320 nm to 1100 nm; Sound level range: 50 dBA to 100 dBA, Accuracy: ± 4 dBA, Resolution: 0.1 dBA, Repeatability: 0.5 dBA; Voltage range: ± 24 V, Accuracy: ± 0.1 V, Resolution: ± 0.001 V, Input impedance: 1MΩ;	13 sets
18	Water quality sensor	Temperature: -35 ° c to 135 ° c, Accuracy: ± 0.5 ° c, Resolution: 0.01 ° c pH / ORP / ISE: 0-12pH 0.001pH resolution	13 sets

No.	Major equipment	Technical parameters	Quantity
		DO: 0-20mg / L, Resolution: 0.01mg / L Conductivity: Range: 0-1,000uS; 0-10,000uS; 0-100,000uS Accuracy: ± 10% (uncalibrated)	
19	Photosynthesis tank	To measure the oxygen consumption during the respiration of yeast To study how does the presence of organic affect dissolved oxygen concentration To study the biological oxygen demand	13 sets
20	Handheld heart rate sensor	Range: 40-240bpm, Accuracy: ± 1bpm, Resolution: 1bpm, Default sampling rate: 1 shot every 5 seconds, Maximum sampling rate: 1 beat every 2 seconds;	13 sets
21	Digital microscope	Connectable directly to the SPARK scientific learning system PS-2008, enlargement of X20, X40, X100	7 sets
22	Mechanics equipment	Bell-shaped cover and battery powered buzzer Manual vacuum pump: The pump rate was 15 ml/hit Hydroelectric demonstration model; basic wind tunnel model DC power supply: Electrical test accessories, adjustable output voltage, dual output, 0-5V, 0-15V;. High-resolution force sensor: Range: ± 50N, Resolution: 0.002N; Maximum sampling rate: 1000 HZ Balanced seat of force sensors	13 sets
23	Thermodynamics equipment	Heat absorbing and radiating devices Radiation demonstration model Specific heat specimens. Ice melting: including 2 building blocks of the same appearance but different materials.	13 sets
24	Electrical equipment	Solar demonstration kit Fun Flystick, including manual with detailed instructions along with useful tips and tricks and five 18.5 "long sticks Electronic capture circuit kit	13 sets

3.4.2.3 Dormitory for teaches in remote rural areas

We will build dormitory for teachers in remote rural areas in counties of weak compulsory education. The establishment of dormitory is economical to meet the demands of earthquake fortification. It can guarantee the working and living condition

for rural teachers with basic vital functions. It is necessary to control the construction standard with an area of 35m^2/room. With washrooms and kitchens, the construction content includes civil engineering and basic decoration engineering. There is a total of 5,200 rooms in 16 counties (cities and districts).

3.5 Environment tools identification

The implementation content of the "World Bank Loan Guangdong Compulsory Education Project" contains 8 projects and 22 sub-projects., which can be divided into the "hardware items" mainly engaged in capital construction and equipment procurement and the "software items" which is aiming at promoting the compulsory education connotation development in accordance with the project natures. Environmental management plan of this project includes standardized classrooms, standard mobile laboratories, and teacher temporary dormitories in poor remote rural areas.

As required by the World Bank, different environment management tools are adopted according to different project types. The report consists of ECOP, SS and EMF. Environment management tools adopted by various sub-items are shown in table 3-3.

Table 3-3 Table of various environment management tools of sub-items

No.	Project content	Project type		
		Small-scale civil engineering/mobile laboratory	School variation	SS
1	Small-scale civil engineering (standardized classrooms and dormitory for teachers in remote rural areas)	ECOP	EMF	SS
2	Standardized mobile laboratory	ECOP	EMF	

Environmental management plan should include the ECOP which expresses the impact of general civil engineering and specific sites as well as mitigation measures for the waste generated by mobile laboratories. Site Specific impact (SS) including

the surrounding sensitive points of the construction project and the sensitive target mitigation measures, as well as the solid waste of construction and safety issues during the construction period. Environmental Management Framework (EMF) should also be included to prevent changes took place in the project school during the implementation. The Bank Group also stresses that during the project construction, the disposal of solid construction waste and security issues should be included in the environmental management plan.

3.6 Selection of environmental impact assessment factors

According to engineering features and construction period of the project as well as pollution sources and influencing source during the operation period and combining with the environment state of the project area, we adopt the table-lookup method to select various environmental impact factors. see table 3-4 for details.

Table 3-4 Table of project environment impact factors

No.	Project type	Environmental factors	Environment impact factors during the construction period	Environment impact factors during the operation period
1	Standardized classrooms and dormitories for teaches in remote rural areas	Water environment	Wastewater of the engineering, construction activities of construction workers	Domestic wastewater
		Acoustic environment	Noise of the construction machinery and transport vehicles	Noise of pumps, motors and other operating machinery
		Ambient air	Construction dust, stack dust and vehicle dust	Odors from public toilets
		Solid waste	Construction waste, building materials and household garbage	Household garbage
		Ecological environment	Earth excavation and water and soil loss	
2	Standardized mobile laboratory	Acoustic environment	/	/
		Surface water environment	/	Experiment wastewater
		Ambient air	/	Vehicle exhaust

No.	Project type	Environmental factors	Environment impact factors during the construction period	Environment impact factors during the operation period
		Solid waste	/	Experiment waste
		Ecological environment	/	/

Chapter IV Project Environment Analysis

4.1 Standardized classrooms and dormitories for teaches in remote rural areas

4.1.1 Main environmental impact analysis

Through the identification of construction content, the impact of standardized classrooms and dormitories for teachers in remote rural areas is mainly from civil engineering. The main impact on environment is from the construction period, including the following:

1、 Atmospheric environment: dust produced by vehicles and earthwork stack on construction sites, dust generated by the mixing operation of concrete and mortar mixing, dust generated by the transport of earthwork, muck, and construction waste as well as exhaust emissions of construction machinery and vehicles. Toilets stink in the operation period.

2、 Water environment: construction wastewater, domestic sewage by construction workers, water pollution caused by water seepage of foundation pit excavation and machinery oil seepage. Domestic wastewater during the operation period.

3、 Acoustic environment: noise produced by construction machinery and transport vehicles. The operation of motorized equipment, bulldozers, excavators, pumps and other machinery will influence the surroundings in the project area.

4、 Solid Waste: Solid waste during the construction period includes construction waste (including steel, site hoardings, packaging materials, fuel storage tanks, lubricants and paint, etc.), waste oil, domestic waste and waste produced by wastewater treatment facilities (such as sedimentation tanks). Domestic waste produced in the operation period.

5、 Ecological environment: land clearing and vegetation clearance will result in loss of habitat and vegetation. Earthwork transfer will cause interference to soil. No

covering protection of material stacks and the excavation place on bad will result in water and soil loss.

In addition, the implementation of the project will bring the local environment with more positive effects. By building standardized classrooms for compulsory education, exploring to build and improve the educational development planning mechanism with timely forecasts and dynamic adjustment of school places for compulsory education in accordance with the circumstances of birth and population mobility, and strengthening the adaptability and effectiveness of public education services, it cannot only replenish the lack of school resources, but also effectively solve the problem of large class quota, making it better adapted to demands for urbanization on the development of compulsory education and reducing the adverse effects of the project on the surroundings.

4.1.2 Major pollution control measures

Aiming at the adverse impact of the two sub-items, namely standardized classrooms and dormitories for teachers in remote rural areas on atmospheric environment, water environment, acoustic environment and solid waste, we put forward the following controlling and mitigation measures:

1. Necessary site hardening and dust suppression; discrete material shall be stored and sealed, take shelter measures when handling, residual dust material after removing stockpile should be eliminated timely; strengthen transportation vehicle control, slow down speed when vehicles move closer to construction site, reduce dust caused by vehicle moving, take sealing measures on transport vehicles handling earthwork, muck and construction garbage.
2. Build settling pond in construction site to subside industrial wastewater. The settled sewage can be recycled for construction site or reducing dust; when lay out irrigation network, ensure its tightness; do not set machine, vehicle maintenance point or cleaning point in construction site. Repair in professional maintenance place so as

to avoid oily sewage in construction site; inspect for oil leak or water leakage before using equipment.

3. Machinery equipment which generates loud noises must have basic damping or vibration attenuation support, including damping material; adopt low-noise equipment and control construction time strictly, put noisy equipment indoor. Make proper arrangement for construction period, avoid simultaneous operation of multiple large scale noisy machine in one construction site; contractor should maintain construction equipment regularly, control it at the best operation mode and lowest noise level; idle equipment in the construction site should be turned off or set in vibration attenuation state; construction transportation vehicles should slow down and do not use horn near construction site.

4. Classify waste generated by construction, dismantle and site clearing, recycle materials that can be used directly or reproducible. Entrust clearance companies to handle the rest. Clearance company must have environmental service quality certificate approved by corresponding department; during construction, if there is oil leakage, clean contaminated soil timely; clear stopper in drainage ditch regularly; when project is over, solid waste from construction should cleared.

See Annex 1 for specific mitigation measures (civil engineering ECOP).

4.2 Standardized mobile laboratory

4.2.1 Main environment impact analysis

Through the identification of construction content, the impact of standardized mobile laboratory is mainly from the transport period of vehicles. The main impact on environment is from the construction period, including the following:

1. Atmospheric environment: dust and exhaust pollution produced by the transporting vehicles.

2. Water environment: experiment wastewater which including acid, alkali, salt, oxidizing agent or reducing agent generated in the laboratory.
3. Solid Waste: experiment waste which including oxides, potassium permanganate, waste hydrochloride generated in the laboratory.

Through equipping standardized mobile laboratory and conducting touring experimental education in rural schools, it solves problems such as reduced rural school scale, insufficient teaching instrument and equipment, experiment teachers, and practice opportunities for students, improves the experimental education level in rural schools and promote the development of quality-oriented education in the background of urbanization.

4.2.2 Main measures of pollution control

Aiming at the impact of standard mobile laboratories on atmospheric environment, water environment and solid waste, we put forward the following controlling and mitigation measures:

4.2.2.1 Atmospheric environment

1. The route of vehicles should be confirmed. It’s better to choose flat road to avoid bumping and reduce dust.

4.2.2.2 Water environment

1、Wastewater which including acid, alkali, salt, oxidizing agent or reducing agent in the laboratory should be sent to WWTPs for final treatment, while the WWTP needs to have the ability to handle the waste;
2、Standardized mobile laboratory service providers should sign laboratory wastewater treatment contracts with the local WWTPs, and perform the linked list system. Moreover, according to the storage capacity of the laboratory wastewater,

sewage should be deliver to the local WWTPs in one or two weeks. Standardized mobile laboratory should keep the treatment receipts for documenting.

3、 The WWTPs should provide their discharge ports monitoring data to standardized mobile laboratory annually. Also, the monitoring data provided by the servicers to the counties (cities, districts) Program Offices, need to save as documents.

4、During the experiment, if the test reagent is accidentally damaged, it should be promptly treated to prevent secondary pollution.

4.2.2.3 Solid waste

1、 To check the number of experimental articles after each experiment. There should be no omission;

2、 The curriculum of the primary and secondary school includes experimental measurement experiment, inquiry-based experiments, demonstration experiment. Experimental waste which including oxides, potassium permanganate, waste hydrochloride generated during the experiment should be disposed in qualified organizations. See Annex 2 for specific mitigation and prevention measures. (Standardized mobile laboratory engineering ECOP).

4.2.3 Due diligence review of the WWTPs

1、Dianbai County —— Guangzhou Baiyun Jianggao (Diaobai) Shift of Industries Park Wastewater treatment plant

Guangzhou Baiyun Jianggao (Diaobai) Shift of Industries Park Wastewater Treatment Plant is located in Guangzhou Baiyun Jianggao (Diaobai) Shift of Industries Park, Yingbin Avenue, Shuidong Zhen, Dianbai District. It serves industries in Guangzhou Baiyun Jianggao (Dianbai) Shift of Industries Park, which covers an area of 18 acres with a total investment of $9 million, using modified SBR+ artificial wetland processes. Otherwise, Construction scale for the daily processing is 30 thousand tons wastewater per day, the current status of assimilative capacity is 1.5 thousand tons per

day. This wastewater treatment plant's main types of treatment is industrial wastewater and domestic sewage. After its treatment, its average wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002). On the other hand, this plant's sewage sludge use as industrial recycling. According to nearly a year water quality monitoring results, the wastewater after treatment reach the quality standards.

Image 1 Guangzhou Baiyun Jianggao (Diaobai) Industries Park Wastewater Treatment Plant

2、Lufeng——Lucheng Wastewater Treatment Plant

The project is two kilometers southeast of Qisha Chun, Donghai Zhen, Lufeng, designed processing sewage treatment capacity of 50 thousand tons per day with total investment of $197.6 million. And its current status of assimilative capacity is 14 thousand tons per day. The plant uses advanced A/A/O micro-aeration oxidation ditch treatment process, covers 39,000 square meters area, serving a population of about 180 thousand with 17.5 square kilometers service area. The assimilative range of area is Lufeng urban city (including the area near the city and the new development zone area). This wastewater treatment plant's main types of treatment is industrial wastewater and domestic sewage. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002). This plant's sewage sludge treatment is evaporated compression landfill. This plant's routine monitors responsible by the Shanwei Environmental Monitoring Station, whom coordinated with the plants worker Zhang

Jinhang. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 1 for water quality monitoring data.

Image 2 Lufeng Lucheng Wastewater Treatment Plant

3、Chaoyang District —— Shantou Chaoyang District Wastewater Treatment Plant

Shoutou Chaoyang District Wastewater Treatment Plant is located in the southern of west side of the city moat. The assimilative range of area including Chaoyang District Miaobei Street, Wenguang Street, Chengnan Street. Treatment plant has 75 thousand tons' wastewater treatment capacity per day, using A^2/O treatment process. After its treatment, its wastewater average quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002).

Image 3 Shantou Chaoyang District Wastewater Treatment Plant

4、Chao'an District —— Chao'an County (District) Wastewater Treatment Plant

Chao'an County (District) Wastewater Treatment Plant is located in the Chao'an County (District), south of the Anbu Zhen Long Chun, designed processing sewage treatment capacity of 80 thousand tons per day, covers 24,600 square meters' area. And its current status of assimilative capacity is 60 thousand tons per day. Its service area includes Anbu south sheet, Annan sheet, east area of Anbei sheet, economic development zone west sheet, southern development zone etc., with 150 thousand serving population. The plant is $187.3 million total investment, using CASS treatment process. Also, its sewage sludge treatment is landfill. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002). Wastewater monitor responsible by the Chaozhou Environmental Monitoring Station, once a quarter. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 2 for water quality monitoring data.

Image 4 Chao'an County (District) Wastewater Treatment Plant

5、Huazhou——Urban Wastewater Treatment Plant

Huazhou Urban Wastewater Treatment Plant is located in south side of Huazhou Guo Street Office Duogu Village Committee, where is about five kilometers away from downtown. This plant is designed processing sewage treatment capacity of 50 thousand tons per day covers a unit of 710 areas. And its current status of assimilative capacity is 21.1 thousand tons per day. Its service area includes Hedong, Hexi, Beian, Xiaguo etc., with 260 thousand serving population. The plant is $190 million initial investment, using A/A/O treatment process. Also, its sewage sludge treatment is "Transfer Sewage Sludge and Linked Lists" system, which means sludge will dispose by strict control of waste treatment qualified professional companies, to reach the requirements of qualification harmless sludge. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plant (GB18918-2002). Wastewater routine monitor responsible by the Huazhou Environmental Protection Agency, whom coordinated with the plants superintendent office. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 3 for water quality monitoring data.

Image 5 Huazhou Urban Wastewater Treatment Plant

6、Leizhou —— Leizhou Wastewater Treatment Plant

Leizhou Wastewater Treatment Plant is located in Leizhou Yuannandu River farm, with a total area of 49,500 square meters, serving a population of 350 thousand people, the design processing sewage treatment capacity of 20 thousand tons per day (supplementary infrastructure constructed as 40 thousand tons sewage treatment capacity per day). This plant uses "A/O/O micro-aeration oxidation ditch" treatment process, which is the patented technology designed by Guangdong provincial Environmental Protection Engineering Research and Design Institute, a company belong to the same group. The plant started construct in March 2009, and completed in March 2010, put into operation after the acceptance concerned in June 2010. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002), meet the acceptance requirements of government and environmental protection departments. Its engineering design and construction of the total size of 40 thousand m^3/d, the first phase of construction scale of 20 thousand m^3/d, which has building and equipment including coarse grid, water pumping station, fine grid, grit chamber, biological treatment tank, secondary sedimentation tank, disinfection, sludge pumping station, blower room, dewatering room, dephosphorization and drug-added room, deodorizing filter room, complex office building and dormitory etc. Leizhou Wastewater Treatment Plant distributed control the entire manufacture process and centralized manage the entire plant via a central control room combined with monitor

computers and communication system as well as a field control station consist with programmable logic controller (PLC) and automated instrumentation. Its sewage sludge treatment is aerobic composting, disposed by qualified company (Zhanjiang Xiashan District Xi Ming Environmental Construction Materials Co., Ltd). Wastewater routine monitor responsible by the Leizhou Environmental Agency, whom coordinated with the Leizhou Public Utilities Office. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 4 for water quality monitoring data.

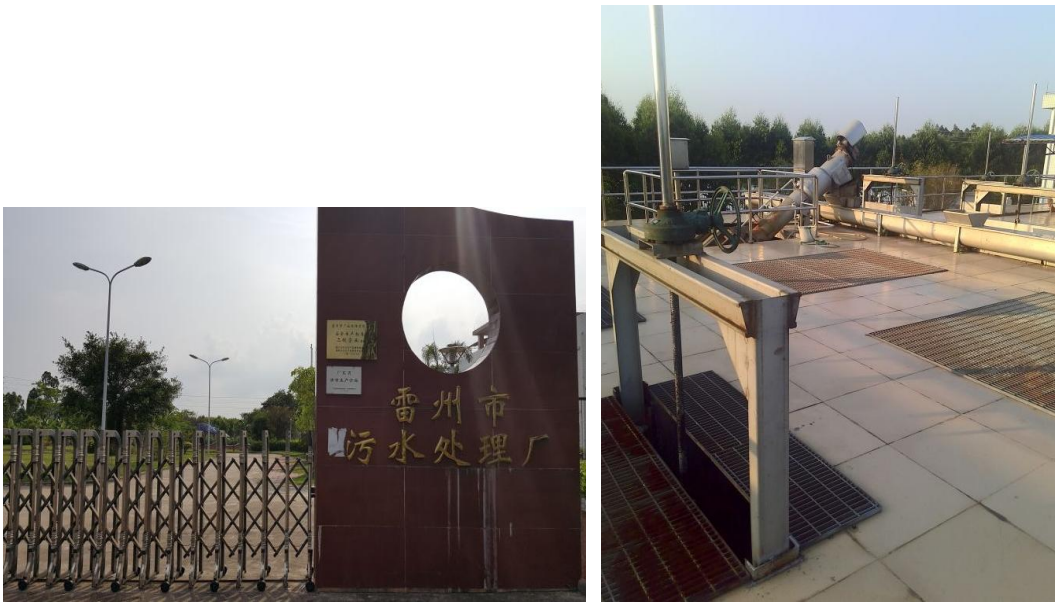


Image 6 Leizhou Wastewater Treatment Plant

7、Luoding —— Luoding Second Wastewater Treatment Plant

Luoding Second Wastewater Treatment Plant located next to Luoding Luocheng town food company Niujiaotang. This plant is designed processing sewage treatment capacity of 20 thousand tons per day covers a unit of 9.16 area. And its current status of assimilative capacity is 20 thousand tons per day. Its service area about 7 square kilometers, with 90 thousand serving population. The plant is $48.6 million total investment, using integrated oxidation ditch treatment process. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Wastewater routine monitor responsible by the Luoding Environmental Protection Agency Monitor

Station. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 5 for water quality monitoring data.

Image 7 Luoding Second Wastewater Treatment Plant

8、Suixi County —— Suixi Wastewater Treatment Plant

Suixi Wastewater Treatment Plant is located west of Suixi County. This plant is designed processing sewage treatment capacity of 30 thousand tons per day covers a unit of 50 areas. And its current status of assimilative capacity is 26 thousand tons per day. Its service area about 4 square kilometers, with 140 thousand serving population. The plant is $59.25 million total investment, using A/A/O oxidation ditch treatment process. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Wastewater routine monitor responsible by the Suixi County Environmental Protection Agency Monitor Station, whom coordinated with the plants superintendent office. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 6 for water quality monitoring data.

Image 8 Suixi County Sewage Treatment Protection

9、Wengyuan County —— Qingyuan Wastewater Treatment Plant

Wengyuan County Qingyuan Wastewater Treatment Plant is located in Wenyuan County West District Industrial Avenue (Niuku Tan Weng Riverside). This plant is designed processing sewage treatment capacity of 15 thousand tons per day covers 2 thousand square meters. And its current status of assimilative capacity is 12 thousand tons per day. It is $33 million total investment, using CASS treatment process and main types of treatment is domestic sewage. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Wastewater routine monitor responsible by the Wengyuan County Environmental Monitor Station, whom coordinated with the plants technical section. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards. See Annex 7 for water quality monitoring data.

10、Wuhua County —— Urban Wastewater Treatment Plant

Wuhua County Urban Wastewater Treatment Plant is on the eastern side of Shuizhai Town demonstration farm, 9 kilometers from the county. This plant is designed processing sewage treatment capacity of 40 thousand tons per day covers 100 thousand square meters. And its current status of assimilative capacity is 30.5

thousand tons per day. Its service area is Wuhua County town and some industry, with 150 thousand serving population. It is $79.21 million total investment, using A/A/O treatment process, as first grade strengthen treatment process combines with artificial wetland treatment process. Also, its sewage sludge treatment is mechanical dewatering, and sludge cakes transport to the landfill for landfill treatment. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Wastewater routine monitor responsible by the Wuhua County Environmental Monitor Station, whom coordinated with the plants laboratory. In the mean time, field monitor data connects with Ministry of Environmental Protection. According to water quality monitoring data provided by the plant, the wastewater after treatment reach the quality standards.

Image 9 Wuhua County Urban Wastewater Treatment Plant

11、Huilai County —— Urban Wastewater Treatment Plant

Huilai County Urban Wastewater Treatment Plant is located in Huilai County Hualake Town Xiyang Chun Chihou. This plant is designed processing sewage treatment capacity of 40 thousand tons per day covers 26.2 thousand square meters. And its current status of assimilative capacity is 20 thousand tons per day. Its service area is Huilai County, Huahu Town, Donglong Town, with 117 thousand serving population. The plant using A/A/O oxidation ditch treatment process. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002).

Image 10 Huilai County Urban Wastewater Treatment Plant

12、Haifeng County —— Urban Wastewater Treatment Plant

Haifeng County Urban Wastewater Treatment Plant is located in Haifeng County Nandaoshan Village. This plant is designed processing sewage treatment capacity of 840 thousand tons per day covers 70 thousand square meters. And its current status of assimilative capacity is 60 thousand tons per day. Its service area is Haicheng Town, Fucheng Town and Chengdong Town etc, with about 200 thousand serving population. The total investment is $218 million. In April 2010, the wastewater treatment plant put into trial operation, and operating in good condition. Treatment process using A/A/O micro-aeration oxidation ditch and UV disinfection process. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002).

Image 11 Haifeng County Wastewater Treatment Plant

13、Jiexi County —— Urban Wastewater Treatment Plant

Jiexi County Urban Wastewater Treatment Plant is located in Jiexi County Pingshang Town Jiantian Village. This plant is designed processing sewage treatment capacity of 13.3 thousand tons per day covers 51.595 thousand square meters. And its current status of assimilative capacity is 12.7 thousand tons per day. The scope of services to Jiexi County 9 square kilometers, serve a population of about 150 thousand people. Treatment process using A/A/O micro-aeration oxidation ditch. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002).

14、Pu'ning —— Pu'ning Urban Wastewater Treatment Plant

Pu'ning Urban Wastewater Treatment Plant is located in south of Pu'ning Zhanlong Town Dingcuoliao Village. This plant is designed processing sewage treatment capacity of 100 thousand tons per day covers about 70 thousand square meters. And its current status of assimilative capacity is 100 thousand tons per day. Its service area is Pu'ning urban centers (including Liusha East Street, Liusha South Street, Liusha West Street, Liusha North Street and Chiwei Street), with about millions serving population. The total investment of about $210 million. Treatment process using A/A/O micro-aeration oxidation ditch. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Daily monitoring of water quality is responsible by Pu'ning City Environmental Protection Office.

15、Lianjiang —— West Urban Wastewater Treatment Plant

Lianjiang West Urban Wastewater Treatment Plant is located between the north of Lianjiang west urban street Shangcunzai Village and Jishui Town Shuiyuanjin Village. This plant is designed processing sewage treatment capacity of 30 thousand tons per day covers about 32.817 thousand square meters. And its current status of assimilative capacity is 25 thousand tons per day. The scope of services is east from the Tielu Bridge and west end to wastewater treatment plant, as the assimilative pipe network

layout along with Lianjiang River, with about 350 thousand serving population. The total investment of about $73 million. Treatment process using A/O process. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Its sewage sludge disposed by qualified company (Zhanjiang Xiashan District Xi Ming Environmental Construction Materials Co., Ltd). WWTP outlets have monitoring equipments and offer data to province monitoring platform, responsible by the Zhanjiang Environment Measure Office.

16、Wuchuan —— Wuchuan Wastewater Treatment Plant

Wuchuan Wastewater Treatment Plant is located in the northeast of Wuchuan, west of Bofu Town, north near the Fenhong River of Meihua River, the other three side is residential and industrial areas. Specifically address is Wuchuan Meilu Town Sugar Industry Road, inside the State Fish farm. This plant is designed processing sewage treatment capacity of 40 thousand tons per day covers a unit of 28 area. And its current status of assimilative capacity is 35 thousand tons per day. According to Zhanjiang Environmental Protection Agency requirements, this plant implemented cleaner production audit by law in 2013, and accepted by the Zhanjiang Environmental Protection Office on 22 November, 2013. Also, the plant according to the law in 2014 to carry out environmental emergencies contingency plan filing work, and in December 2014 accepted the Wuchuan Environmental Protection Office emergency prepare plan. Treatment process using A/A/O process. After its treatment, its wastewater quality reach the grade-1 B standard of Discharge Standard of Pollutants for Municipal Wastewater Treatment Plan (GB18918-2002). Its sewage sludge disposed by qualified company (Zhanjiang Xiashan District Xi Ming Environmental Construction Materials Co., Ltd). According to the Guangdong provincial key enterprise self- monitoring data monitoring information publishing platform, Wuchuan Wastewater Treatment Plant discharge water quality reach the standard the whole 2015. Water quality monitoring data in Annex 8.

4.3 Social impact assessment

The proposed locations of "World Bank Loan Guangdong Compulsory Education Project" involve 16 counties (cities and districts), namely Chaoyang District, Wengyuan County, Wuhua County, Haifeng County, Lufeng City, Suixi County, Lianjiang City, Leizhou City, Wuchuan City, Dianbai District, Huazhou City, Chao'an District, Huilai County, Puning City, Jiexi County and Luoding City, with wide social impacts and closely related construction links. The key to the smooth implementation of the project greatly depends on the willingness and attitude of project stakeholders. In order to serve the optimized design and effect implementation of the project, the Department of Education of Guangdong Province entrusts Sun Yat-sen University to compile the social impact assessment report. In accordance with security assurance measures of the World Bank, the Environment Management Plan needs to combine with social assessment to conduct social impact assessment analysis.

4.3.1 Positive social impact

The impact of "World Bank Loan Guangdong Compulsory Education Project" is majorly positive. Through initial design and research, it will bring in great ecological, social and economical benefit on the following aspects:

1. Improve school environment. The implementation of "hard programs" of this project will undoubtedly improve school environment on the aspect of external conditions. The construction of standardized classroom, for another example, has the direct positive impact of relieving problems of "oversized class" and old classrooms. However, super oversized class with more than 100 students can still be found at the survey points based on fieldwork. In such oversized class, the efficiency of students for listening to the lecture is usually quite low. On the other side, due to large number of students and limited teacher resources, teachers can hardly give consideration to study and life of every student. Students' learning initiative may be reduced, and then, the risk of school dropout will increase. As for the problem of classroom aging, some

classrooms have been used for a long time and are now dangerous building. They bring safety risks to students. The repair or rebuilding of them can directly improve students' school environment.

2. Facilitate daily life. The increase of turnover dormitory helps to improve the status quo of teacher dormitory shortage and relieve the housing problem (no house or inconvenient housing conditions) faced by teachers in remote and border areas. In this way, teachers can be "reassuring and happy for teaching". Improvement of hardware facilities for daily life is logistics base and guarantee for teachers to carry out teaching activities. Improvement of hardware facilities can generally attract talents for "inflow" and "retaining", which can facilitate the realization of mountainous area talent strategy for long run and promote social and economic development of remote areas. Viewing from the consideration of some parents of students, the construction of turnover dormitory can increase time of teachers to accompany students, communicate with students and coach students for study. In this way, parents of students will feel more relieved.

3. Attention left-behind children. Judging from positive impacts on schools and teachers, systematic care for left-behind children can relieve the current situation that left-behind children do not like study or dislike study. Learning initiative of left-behind children can be improved. The implementation of this program in counties with large quantity of left-behind children helps to improve teaching quality as a whole. The assessment team, however, also believes that the education of left-behind children is not the responsibility of only the school, but the responsibility to be jointly assumed by the family, the school and society. Positive impact of the school on the education of left-behind children lies in counseling and care of left-behind children by professional psychological teachers. The family and society should pay attention to the education of left-behind children fundamentally.

4.3.2 Negative social impact

All basic engineering construction projects, including the construction and reconstruction of standardized classroom and turnover dormitories for teachers in remote rural areas, must not involve new land acquisition which is the precondition for project declaration and establishment. The majority engineering construction work is located at the campus with legitimate land certificates. Therefore, this project does not involve acquisition of new land and will not affect any population due to land acquisition. However, temporary resettlement and population affected by temporary resettlement may also be involved during construction. According to the Social Impact Assessment Report, potential social risks likely to occur for this project mainly include:

1. Potential risks from project implementation. Risks relating to project construction. The social assessment team believes that construction of standardized classrooms and turnover dormitories for teachers in remote rural areas involved in this project may have certain risks, including how to avoid the teaching areas for construction or how to avoid influence on normal teaching order in construction process and how to ensure personal safety of active objects in the teaching area (such as students, teachers, etc.).Engineering construction may produce noise pollution, environmental pollution and construction wastes. Risks on the maintenance of school's eco-environment and normal order may also be caused. The failure to well avoid or mitigate such negative impact in construction process may easily cause conflict between the school and the implementing agencies, which will affect construction progress.

2. Risks of removal and temporary relocation. Risks caused by demolition and temporary resettlement. It has been confirmed in declaration period that construction of standardized classrooms and turnover dormitories for teachers in rural remote and border areas will be carried out within the fence of the school. Therefore, land acquisition will not be involved. However, house construction may involve the

dismantling and reconstruction of original old houses and then, the temporary resettlement of original house users will be involved. For example, students may have to transfer to temporary classrooms, or teachers may have to seek for temporary residence. According to the field survey and the data submitted by the project school, there are two project schools in Wengyuan County need to carry out temporary resettlement. Specifically, Jiangwei Town central primary school involves two families of teachers, while Bazai Town central primary school involves ten affected residents. Huilai County has 16 residents, including 42 people, in one project school need to be temporarily settled. The evaluation team believes main influencing factors of temporary resettlement are as follows. Firstly, looking for temporary housing. Secondly, the influence of new settlements on daily life. Thirdly, resettlement costs. Fourthly, temporary resettlement period. Lastly, distribution of the new houses. In order to reduce risks, the social assessment team believes that it is necessary to properly deal with teachers and students for temporary resettlement and develop appropriate settlement measures so that they can be well accommodated in project implementation process. For more details, refer to the China: Guangdong Compulsory Education Project (P154621) Abbreviated Resettlement Plan and China: Guangdong Compulsory Education Project (P154621) Resettlement Policy Framework.

3. The construction of standardized mobile laboratory is blank and there is lack of management experience. Standardized mobile laboratory is still new in 16 project counties (cities/districts). There is no similar construction and management experience. Dianbai District, Lufeng City and Chaoyang District that have applied for this program also have not yet develop dedicated management plan. Their current idea is to use the laboratory as a window to add knowledge and stimulate learning interest of students and operate in the way flowing among schools so that students in all middle and primary schools can get to know such a new thing.

4. Teacher turnover dormitories are generally serious deficient with poor accommodation conditions and poor dormitory management system. As for teacher

dormitories, all project counties (cities/districts) have large problems left over by history. From Table 5-4, it can be seen that the gap of teacher turnover dormitories in schools applying for this program is generally above 60%. The gap rate of Wuchuan and Suixi is lower than 50% but higher than 30%. Since many teacher dormitories were built long ago at low standard, accommodation conditions are generally quite poor.

5. The project has a long time span and duration with problems in early-stage system construction and later-stage management and maintenance. The social evaluation thinks that due to the repetition in hardware investment and the aging of information hardware equipment, classrooms and dormitories, the “hard project” has problems in technical services and later-stage maintenance and management. Currently, the project is under preparation, thus related participants have no thorough consideration on later management methods and stipulations.

4.3.3 Social risk control measures and suggestions

To help project participants to equally enjoy social benefits of the project, the assessment team has actively carried out investigation at various areas based on social risks of the project identified so as to sufficiently get to know relevant regulations and policies at various levels; the team has actively encourage public involvement and organized sufficient discussion with main stockholders, including related governmental organizations, owners, implementation organizations, residents in the project area and others. On this basis, the social assessment team makes the following suggestions to minimize social risks likely to be caused by the project.

1. In view of risks likely to be caused by project construction, the social assessment team suggests that:

1) If the construction site is near to teaching area, the construction unit should set up sound insulation bar, fence (wall) and set up obvious warning signs at places with hidden danger.

2) If traffic within the school will be affected by construction, the construction unit should set guard railing and sign posts on main roads and set up warning signs at dangerous places. Set up sound insulation rail at places near to main teaching areas and reduce work time during daytime passenger flow peak hours. Take measures for night construction.

3) For construction wastes likely to be generated in construction process, specify measures of recycling in advance.

4) The school should strengthen security work during construction.

2. In view of "soft programs" in this project, the social assessment team suggests that,

1) Strengthen system construction. Ensure specific institutional guarantee for main participating bodies in project preparation stage, project implementation stage and project evaluation stage. As for the education of exceptional children for example, strengthen publicity and guidance and eliminate prejudice to vulnerable groups. As for programs about classroom and teaching reform, have a try for differentiated education reform and design targeted education and teaching contents based on different background for the growth of rural and urban students.

2) Strengthen future supervision. Put forward objective and feasible supervision and evaluation system in project preparation stage, project implementation stage and project evaluation stage and pay attention to the formulation of differentiated evaluation standards.

3. Risks relating to demolition and temporary resettlement. Suggestions:

1) Ensure sufficient consultation, information and reasonable resettlement of the group for temporary resettlement. Before temporary building demolition or movement of classroom, inform population to be removed or transferred sufficiently and try to obtain sufficient understanding of people negatively affected.

2) Consult with people negatively affected and develop reasonable measures on demolition and temporary resettlement. If temporary house demolition is involved,

consider to develop corresponding compensation measures based on temporary resettlement compensation standard and offer proper subsidy for resettlement.

3) Improve the late stage supervision and evaluation. In the project preparation stage, the project implementation phase, the project appraisal stage, develop objective and feasible monitoring and evaluation system, and notice the difference evaluation standards making as well as effects of scientific evaluation of project.

4.3.4 Brief summary on social impact

In the context of "deepening comprehensive reform in the education field" by the state, this project is the concrete embodiment of Guangdong Province to actively promote comprehensive reform of the education system. Combining with actual situation, Guangdong proposes the "Project of Balanced and Standard High-quality Development of Compulsory Education at Underdeveloped Areas of Guangdong Supported by World Bank Loan" to address the problem of weak education performance in counties with poor performance on compulsory education in principles of reform and innovation, balanced development, overall coordination and intelligence introduction. The project will greatly promote the balanced development of compulsory education in Guangdong and will make huge contribution to relieve poverty of underdeveloped areas of Guangdong. Besides, it will help counties with poor performance on compulsory education for attracting talents, promote coordination between economic development and social development and create significant social benefits.

This project will take a long run to display its roles in education reform and promotion. It will mainly have the following roles. First, it will comprehensively improve education and teaching environment; second, it will improve hardware infrastructure of schools in counties with poor performance on compulsory education; third, it will improve the talent structure, strengthen talent training, attract talents to promote regional social development and regional urbanization; fourth, it will promote employment in relevant industries during and after the completion of project

construction; fifth, it will accumulate valuable experience for sustainable education development, reform and innovation.

The implementation of the project will also promote capacity building of education bureaus, other educational institutions and project implementing organizations at the project area. Through introducing advanced project management methods and establishing advanced office management system, this project will also promote the training of a batch of professional educational projects management staff. This project covers rural and urban poor students. It helps to improve education conditions of poor students and improve their level for being education. This project covers the left-behind children and the disabled students. It can improve education level for the left-behind children and the disabled students and promote education fairness.

Chapter V Management System of Environmental Management Plan

The proposed locations of this project involve 16 counties (cities/districts) in Guangdong Province, comprising 250 standardized classrooms, 4 standard mobile laboratories and 5200 teacher temporary dormitories in poor remote rural areas. This project covers a large range and has complicated construction content. In order to minimize negative influences on environment caused by project implementation and put environmental management into practice. As required by regulations and actual project demand, in order to achieve demonstration effect, this project is not only supervised by Environmental Protection Department(EPD)but also assign designated personnel from project management office (PMO) at each level to be in charge of environment management, and establish environmental management system consisting of supervision institution, enforcement body and consultation service agency.

5.1 Setup of environmental management organization

For setup of environmental management organization, please refer to Figure 5-1 and Table 5-1.

Table 5-1 Constitution of environmental management system

Nature of organization	Name of organization	Organization task
Administrative organization	Provincial project management office(PMO)	Assign specialized environmental manager to be in charge of EP works at project planning, design and implementation stage, make sure work procedure meet with environmental assessment (EA) and management requirement by China and WB, coordinate with implementation of environmental management plan. For details, please refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations".
	Project management office of each county	Appoint specialized EP personnel to be in charge of environment supervision and management during project construction and operation period, daily supervision when project is completed, so as to minimize negative influences on environment caused by this

Nature of organization	Name of organization	Organization task
	(city/district)	project or reduce it to an acceptable level, meanwhile give full play to its environmental benefit; make arrangement for funds required by EP works and be in charge of regulating and filing relevant documents. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
	PMO of Schools	Appoint specialized EP personnel to be in charge of environment supervision and management during project construction and operation period, daily supervision when project is completed, so as to minimize negative influences on environment caused by this project or reduce it to an acceptable level, Responsible for the collation of the school-related documents and archives. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
Supervisory organization	Environmental protection administrative department (EPAD) at different levels	Government monitoring and management organization is responsible for supervising and checking work procedures for compliance with environment management in China, pollution prevention measures shall meet with this requirement. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
	WB	Dispatch environment technique expert to supervise and check implementation of EP regulations. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
Environmental assessment organization (EAO)	Environmental assessment unit	Accept commission, compile project environment report. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
Consultation services organization	Environmental supervision (ES) unit	Accept commission, supervise and manage daily production activities of construction units. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
	Environmental monitoring unit	Qualified environmental monitoring organization is responsible for monitoring works at project operation stage. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
	External environment expert group of provincial project management office	Assist provincial project management office in checking EP works of each subproject and guide environment assessment unit and implementation unit to design and put EP measures into practice. Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.
Implementation	Civil work	Assign site environment engineer, put contract conditions and terms

Nature of organization	Name of organization	Organization task
organization	contractor and PMO of schools	as well as EP measures specified in bidding document into practice, satisfy demand on environment protection by WB, local EPD, submit construction checkup list (attached list 1 and attached list 2). Refer to "5.2 Responsibilities and personnel allocation for environmental management system organizations" for details.

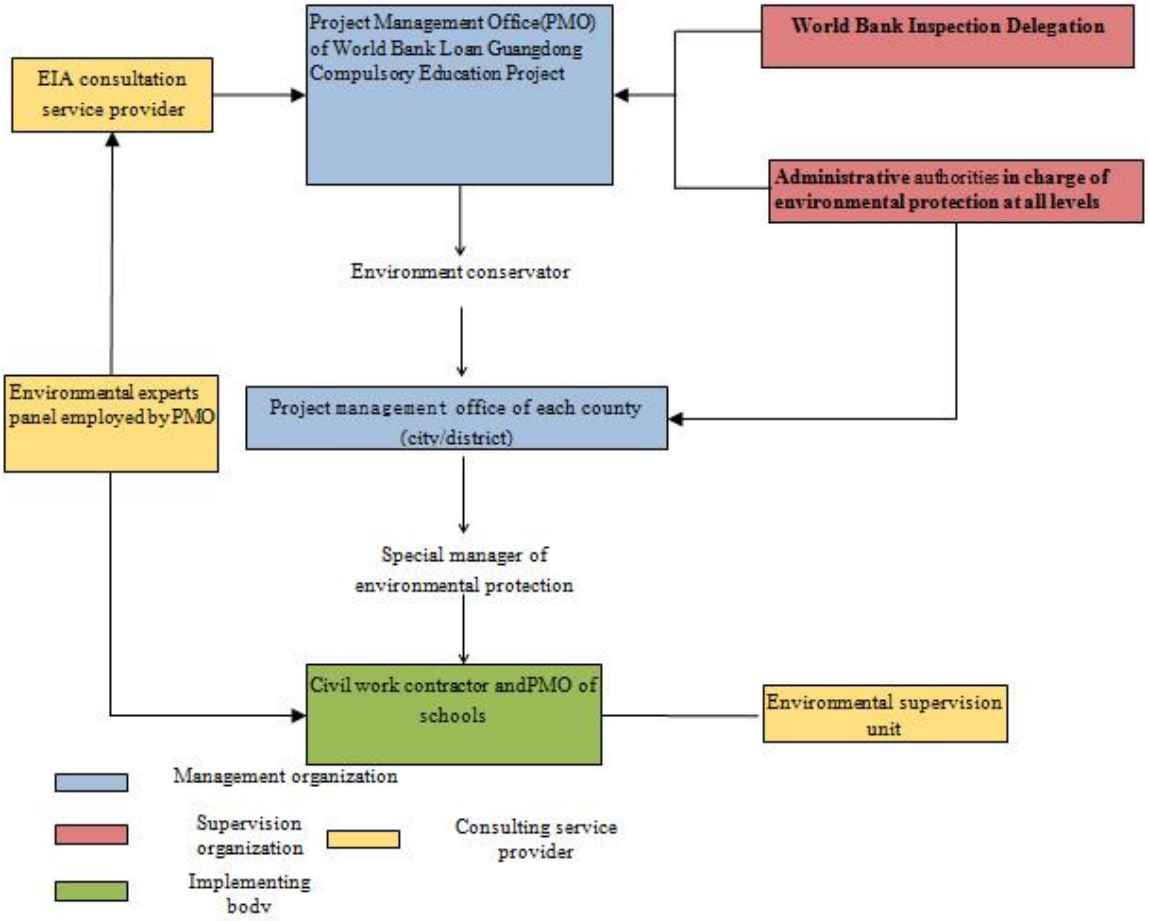


Fig. 5-1 Environmental management

5.2 Duties and Staffing of Each Organization in Environment Management System

The environmental management system of World Bank Loan Guangdong Compulsory Education Project comprises project management organization, supervision

organization, implementing body and consulting service provider, which jointly constitute a complete project environmental management system, play different roles therein, and bear different scopes of duties. The project is developed under the direction of provincial project management office and county-level (city/district-level) project management offices so as to ensure the working procedures and implementation of pollution control measures for project are compliant with relevant provisions of China and the World Bank. The duties and staffing of each organization involved in this project are shown in Table 5-2 below.

Table 5-2 Responsibilities of environmental management system organizations

Name of organization	Type of organization	Personnel allocation	Organization responsibility
① EPD at different levels	Supervision organization	1 person	1. Supervise environment throughout project according to law, including: approval of project environment evaluation report (EA of subproject), project construction and operation.
②Provincial project leader team and management office	Management organization	1 person	1. Compile and supervise implementation of Environment Management Plan; 2. Monitor, coordinate and put China and WB environment management requirement into practice; 3. Submit relevant report to WB every half year; 4. Check environmental management works in project management offices at each level; 5. Coordinate with other department about major environment problems; 6. Entrust invited environment expert team to check this project.
③Project management office of each county (city/district)	Management organization	1-2persons	1. Compile and supervise implementation of subproject environment management system; 2. Compile and submit EA document in China for approval; 3. Make project design meet with EA requirement; 4. Include EP measures of this EMP in project construction contract; 5. Hire, monitor and coordinate with project supervision (qualification, responsibility and management); 6. Implement environment management training plan; 7. Organize monographic study or relevant research; 8. Record and clear up complaint occur during project construction

Name of organization	Type of organization	Personnel allocation	Organization responsibility
			and operation, explain results to the public and solve public complaints; 9. Review environment supervision and environment consulting report; 10. Submit report to provincial project management office every quarter (statement); 11. Sign site verification form submitted by construction unit and supervision unit, verify environmental problems and file up. 12. Receive daily environmental check (including WB project check).
④World Bank	Supervision organization	1person	1. World Bank send inspection team to check project implementation every year; 2. Check implementation status of this project loan agreement and Environment Management Plan.
⑤Unit that has Class A certification of construction project influence evaluation	Environment assessment organization	3persons	1. Have field visit to each project and evaluate its environment; 2. Compile Environment Management Plan.
⑥External environment expert group of provincial project management office	CSO	1-2persons	1. On-site inspection of construction site and contractor, assist provincial project management office in environment protection of each subproject; 2. Guide environment assessment unit and implementation unit to design and implement EP measures, submit draft report to provincial project management office and put forward suggestions and comments on EP measures. 3. Recognize newly added subproject of schools, fill up newly added project selection list, determine which mode to choose and come up with suggestions.
⑦ Engineering project supervisor (PS) (in charge of environment supervision)	CSO	1-2persons	1. Engineering PS is entrusted by provincial project management office or local project management office; 2. Monitor domestic sewage disposal, industrial wastewater treatment, water loss and soil erosion prevention measures, waste gas, dust, noise control measures, production, domestic garbage and bottom mud disposal, epidemic prevention in construction area; 3. Fill up checkup list in Environment Management Plan attachments (attachment 1 and attachment 2); 4. Come up with rectification and solution to EP problems occur during construction and follow-up, including issuing rectification

Name of organization	Type of organization	Personnel allocation	Organization responsibility
			notice (attachment 3), rectification form, and file inspection documents; 5. Make sure construction unit compile and submit project construction status to DPO every week.
⑧Civil work contractor and breeding farm owner	Implementation organization	Several	1. Formulate EP measures for each construction period; 2. Receive supervision and inspection for environment protection carried out engineering PS, WB and environment protection at each level; 3. Establish feedback mechanism, finish rectification within 3 work days after receiving rectification notice (for those require management organization coordination, finish rectification within 10 work days); 4. Finish construction checkup list before completing construction with engineering PS (attachment 1 and attachment 2), report to DPO; 5. Construction unit should report project implementation status to engineering PS every week.

5.3 Environmental management tasks at different stages of this project

Environment management task (EMT) varies from project implementation stages, as shown in Figure 5-2. The most important work of environment management plan is to make sure all EP measures are put into practice, including ① measures incorporated into environment management plan during project design and contract stage; ② check efficiency and implementation status of EP measures by monitoring construction unit's work; ③project acceptance, daily supervision during operation period, check mechanism, report mechanism and file mechanism of environment management plan. Timeliness is reflected by checking daily work.

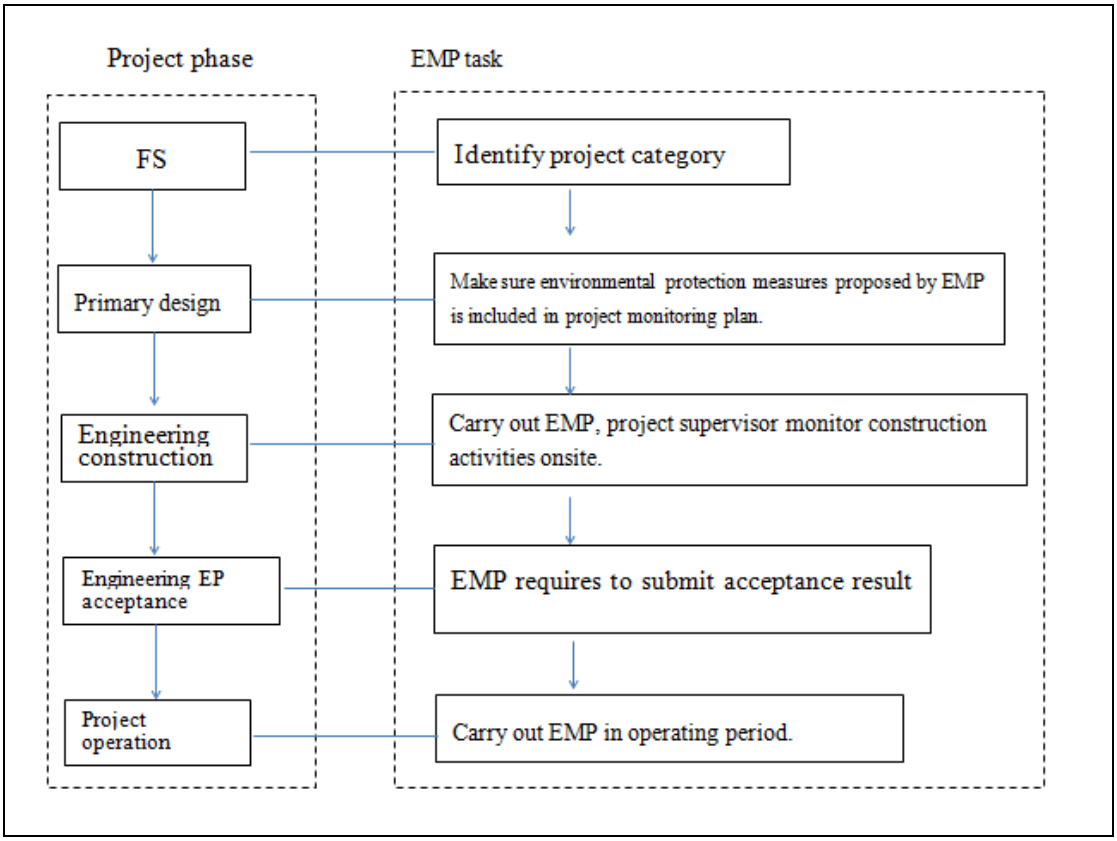


Fig. 5-2 Environmental management tasks at different stages

5.4 Environmental supervision (ES)

5.4.1 Supervision purpose

During project construction period, PS (also environment supervisor) should monitor environment, supervise and check implementation and efficiency of EP measures in accordance with environment protection design, handle and solve temporary contamination accident timely. Supervision result during construction period is served as foundation for project acceptance and necessary special report for acceptance report.

5.4.2 Supervision content

In accordance with guideline, policy, decree and regulations of national and local government and WB, supervise contractors to follow EP clauses in contract for a construction project. Major responsibilities include:

1. Compile environment supervision plan and determine supervision items and content.

2. Review EP content in bid and tender documents for construction.

3. Supervise contractor, avoid and lighten environmental pollution and damage to farmland, wild animals and plants caused by construction works, meanwhile avoid fire.

4. Supervise and check EP works and efficiency based on survey and supervision data, and handle and solve environment pollution accidents timely.

5. Have an overall check on slag disposal pit, construction slash disposal and recovery in construction unit's charge, including slope stabilization, slash recovery, afforestation and landscaping ratio, etc.

6. Put environment supervision into practice, review relevant environment statement, make requirement on channel construction management based on monitoring results of water quality, environment air and noise, reduce negative influences on environment caused by construction.

7. Record and report daily supervision, take part in completion acceptance.

5.4.3 Work procedure of EMP implementation during construction period

ES is an important component of environment management which has relative independence, therefore, independent environment supervision organization is established. Qualified unit is responsible for supervising, reviewing and evaluating EP measures implementation in accordance with contract terms, national EP laws, regulations and policies, monitoring data and inspection results; discover and correct construction behavior which violates contract terms and national EP requirement. Environment supervisor should at least check construction site once a week, fill up construction management checklist (attached list 1 and attached list 2) and file up, come up with rectification plan for environmental problems existed in construction activities and follow up, report to environment person in charge of project

management office and WB expert half year. Workflow of construction environment supervision is shown in Figure 5-3.

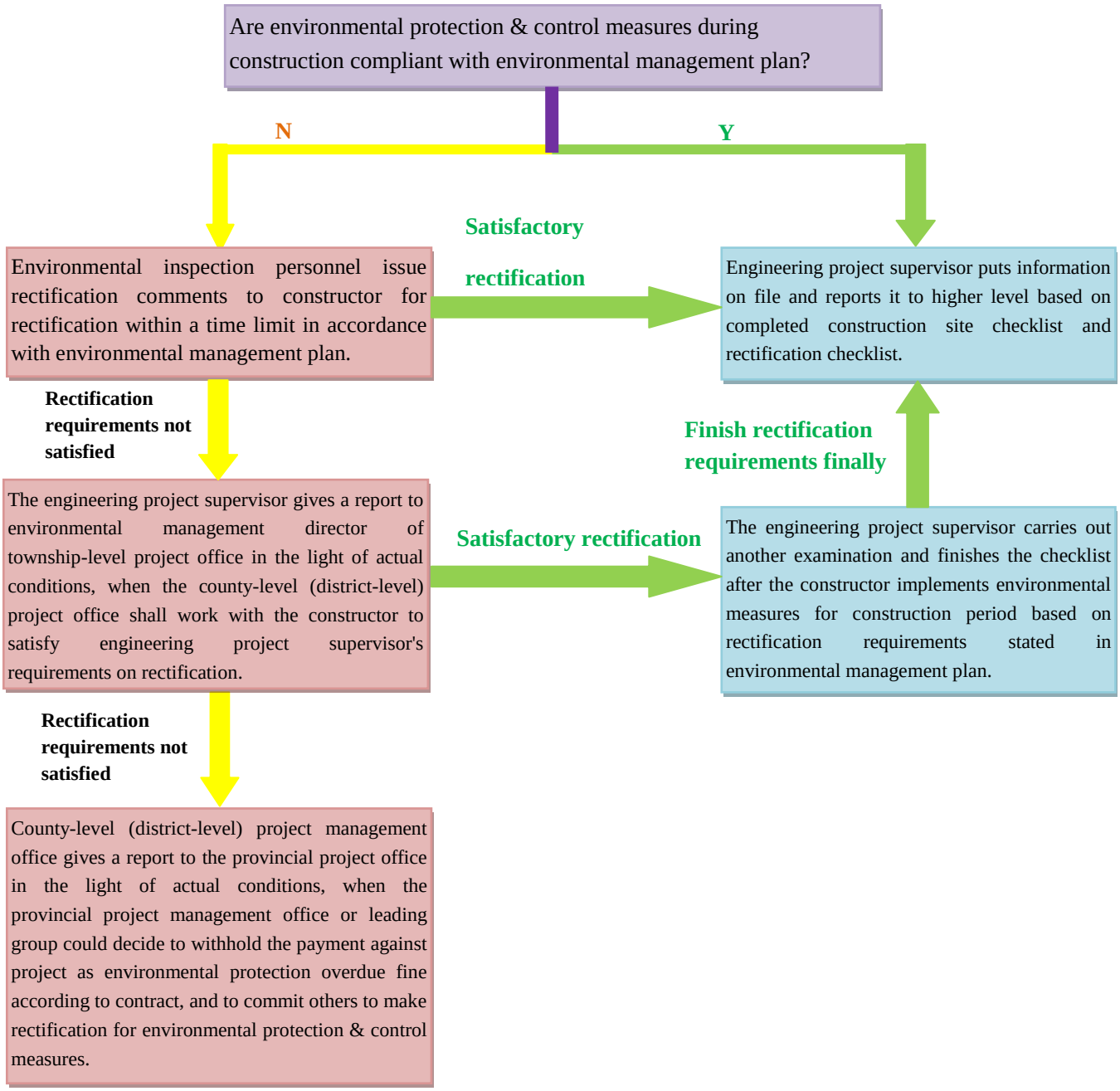


Fig. 5-3 Work flow of environmental supervision in construction period

5.5 Environment management training

5.5.1 Training purpose

The purpose of Environment management training is to ensure smooth and effective launch of environment management works, to familiarize relevant personnel with environment management content and procedure, to improve personnel ability and to ensure effective practice of EP measures. Major target of environment capacity building is environment manager and supervisor. Their training is a constituent part of this project's technical support. During project implementation, the training courses are also accessible to construction party and workers. Before starting construction, all construction unit, operation unit and construction supervisor should participate in compulsory environment, health and safety training.

5.5.2 Training target

Targets of this training are: staff in project management office at province, city and county level, project owner (PO), environment supervisors, representatives of environment monitoring organization and contractors.

5.5.3 Training content

1、Understanding and application of WB environment policies, EP laws and regulations as well as environment standard at home and abroad;

2、Environmental management mode of WB loan project and environment terms in loan agreement;

3、Environment management plan of each project;

4、Environment management regulations of each project;

5、Responsibilities of environment managers, supervisors, monitors and their relationships;

6、Environment management report, environment supervision report, environment monitoring report

5.5.4 Training Outlay

The expense of training in construction period for environmental management plan of "World Bank Loan Guangdong Compulsory Education Project" is to be included in the project budget, and the training funds in construction period are included in operating and maintenance costs.

Table 5-3 Capacity building and training schedule

Training theme	Training target	Training content	Number of times	Day/time	Number of people in this project/time	Budget (ten thousand yuan)
Construction period						
EP regulations and policies	PO, construction unit	Ⅰ EP laws and regulations	4	0.5	3	3.5
		Ⅱ Environmental policies and plans	4	0.5	3	
		Ⅲ WB environment management	4	0.5	3	
Implementation of environment management plan	construction unit 、 PO	Ⅰ EP responsibilities during project construction period	1	0.5	4	14.5
		Ⅱ Major EP tasks during project construction period	1	0.5	4	
		Ⅲ Major EP content during project construction period	3	0.5	4	
		Ⅳ EMP (including environment management regulations)	2	0.5	4	
		Ⅴ Correction or amendment of EMP	1	0.5	4	
		Ⅵ Construction security	1	0.5	2	
Security training	PO 、 construction unit	Biogas operation safety	1	0.5	4	0.5
Subtotal in construction period						18.5

Training theme	Training target	Training content	Number of times	Day/time	Number of people in this project/time	Budget (ten thousand yuan)
Operation period						
Environment protection facilities and measures	PO	Ⅰ Regulations and rules for environmental safety.	2	0.5	1	3.5
		Ⅱ Emergency plan for biogas operation	2	0.5	1	
Subtotal in operation period						3.5
Total						22

5.6 Public complain and feedback mechanism

5.6.1 Public complain

Residents' comments and opinions are collected by seminars or questionnaire during evaluation period of project environmental influence. The public can put forward their comments in seminars or fill up questionnaire sent by evaluation unit or ask for questionnaires; they can also express their opinion to construction unit or evaluation unit by letters, phone calls, fax, or emails; or visit county (city) environment protection bureau or complaints office of each project.

During project construction or operation, the public can put forward their comments to construction unit or evaluation unit by letters, phone calls, fax, or emails; or visit environment protection bureau or complaints office of each project county (city、district).

When environment evaluation unit, construction unit or constructors receive complaints or rectification notice sent by administrative department, they should visit and investigate with relevant department such as design department, rectify according to actual situation, display rectification plan publicly to solve environment protection issues.

5.6.2 Feedback mechanism

EMP will adjust mitigation measures and improve environment management activities according to environment monitoring report and supervision organization inspection.

If significant deviation from EMP is discovered, or project change has caused huge negative influence on environment or increased number of people be influenced, the project management office will consult environment organization immediately, WB will establish environment assessment team to carry out extra assessment. If necessary, additional public consultation is required. The modified EMP should be known to implementation organization and contractors and be implemented accordingly.

Chapter VI Environmental Management Plan

Environmental management plan is established by identifying the adverse effect of each construction work process on environment based on construction project content recognition result, and proposing the engineering and managing measures for preventing or mitigating project-induced negative environmental impact. The physical measures of environmental management plan for this project include the ECOP, SS and environmental management framework (EMF) for the following 2 sub-projects.

6.1 Civil Work ECOP

Civil works include standard classroom and teacher temporary dormitories in poor remote rural areas. Appropriate mitigating measures for civil engineering construction are respectively proposed for engineering design period, construction period and operation period through the above-noted screening of environmental impact assessment factors; see Appendix 1 for details.

6.2 Standardized mobile laboratory ECOP

The principal construction focus of standard mobile laboratories is "purchase service"; this ECOP brings forward mitigating measures for engineering operation in respect of aquatic environment, ecological environment, acoustic environment and solid wastes, etc; refer to Appendix 2 for details.

6.3 Site Specific Impact(SS)

The surrounding sensitive points and sensitive targets of civil engineering projects will be affected by different degrees during the construction period. At first, the sensitivity and the sensitive target are identified by SS and the corresponding mitigation measures as well as the construction of solid waste and school safety issues such as road traffic problems are put forward; refer to Appendix 3 for details.

6.4 Environment Management Framework EMF

Since the school is still in the process of application, the school site is likely to change during project preparation and implementation in view of the long project construction period; to normalize the implementation and operation of schools added to the project in future, the environmental management framework (EMF) for school modification was established as shown in Appendix 4.

6.4.1 Mitigating Measures for Environmental Impact of Civil Work

6.4.1.1 Mitigating Measures for Environmental Impact in Design Period

I. Requirements on Site Selection

1. Site Selection of Standard Classroom

Project development shall tally with local overall planning, take into account local practical situation, and properly handle the relationship between centralization and dispersion, between treatment and utilization, and between short-term and long-term.

The key principles include:

1) Address the teaching requirements of schools with poor compulsory education to the greatest extent in a convenient and practical manner.

2) The buildings and desks and chairs for standard classroom shall be designed in strict accordance with physical demand of schools with poor compulsory education so that standardized classrooms functionally meet practical needs of project object, and that the project development could mitigate such issues as "insufficient teaching space" and "large class quota" to a greater extent.

3) All procedures required have been handled; the use of land involves no land acquisition, relocation and land dispute (project school is expected to provide a

certificate stamped by county-level (city/district-level) land administration authorities), and complies with local planning.

4) The project is carried into execution through open bidding, of which the process must be just, fair and open so that the project investment could be properly allocated.

5) Each standard classroom has a floor area of 100m^2; the plan layout shall be square and regular to the greatest extent; unilateral corridor shall be used for energy efficiency whenever possible.

6) The design shall be concise, generous and cost-effective to the extent where the design is compatible with existing buildings of project object.

7) Decoration design shall reflect the control over cost-effectiveness and functional applicability; the selection of material shall incarnate the focus wherever possible; secondary parts shall be made from mid-low-end materials.

8) Exterior works mainly include the works of outdoor water supply and drainage, power supply and communication etc. required within scope of buildings, as well as the roads, squares, greening and site grading, etc.

9) The design life of main frame structure (no steel structure is allowable; no brick-concrete structure is allowable in principle) is 50 years.

10) The seismic fortification intensity could be a grade higher than the specified intensity for Guangdong Province; alternatively, higher-level seismic fortification measures could be employed at the same grade.

11) The water supply and sewerage works in buildings should make the most of existing water source and drainage system; where the school site is not furnished with water supply & drainage system and municipal piping network due to its remote location, water source and drainage system shall be provided as appropriate. Where water source is not available actually, appropriate investment in water supply and sewerage works shall be allocated thereto.

12) Electric power works within buildings shall make the most of existing power supply system in principle; where no power supply is available, appropriate investment in power supply works shall be allocated thereto.

13) The configuration of light-current system shall be adequate for computer network, telephony and cable television etc. Generic cabling system shall be established depending on local practical situation of project.

14) Multimedia classroom is furnished with the following facilities as appropriate: Multimedia PC (1 set) as well as DVD player and visual presenter etc. (1 set, respectively), multimedia projector (1 set), power amplifier, speaker, and control system.

2. Site Selection for Teacher Temporary Dormitories in Poor Remote Rural Areas

Project development shall tally with local overall planning, take into account local practical situation, and properly handle the relationship between centralization and dispersion, between treatment and utilization, and between near future and far future.

The key principles include:

1) Minimize investment while addressing functional needs.

2) Carry out construction in strict accordance with national and local related laws, regulations, codes and standards, and comply with seismic requirements.

3) All procedures required have been completed, and the use of land involves no land acquisition and relocation and is in conformity with local planning.

4) It's essential to strictly control the construction standard: The floor area of each teacher temporary dormitory shall not exceed 35 square meters; the dormitory is furnished with kitchen and bathroom, as well as simple decoration. The plan layout shall be square and regular to the greatest extent; unilateral corridor shall be used for energy efficiency whenever possible.

5) The design life of main frame structure (no steel structure is allowable; no brick-concrete structure is allowable in principle) is 50 years.

6) The water supply and sewerage works in buildings should make the most of existing water source and drainage system; where the school site is not furnished with water supply & drainage system and municipal piping network due to its remote location, water source and drainage system shall be provided as appropriate. Where

water source is not available actually, appropriate investment in water supply and sewerage works shall be allocated thereto.

7) Electric power works within buildings shall make the most of existing power supply system in principle; where no power supply is available, appropriate investment in power supply works shall be allocated thereto.

8) The configuration of light-current system shall be adequate for computer network, telephony and cable television etc. Generic cabling system shall be established depending on local practical situation of project.

II. Design Requirements for Standard Classroom and Teacher Temporary Dormitories in Poor Remote Rural Areas

1、Where there are WWTP and municipal pipe network around the school, the domestic sewage shall be led via municipal piping network to wastewater treatment plant for proper treatment during operation period; provided that the urban wastewater system around school has not been established or is under construction, the development of municipal piping network and wastewater treatment plant shall be accelerated, while domestic sewage shall be disposed of with three-stage septic tanks;

2、Three-stage septic tanks shall be designed with septic tanks with adequate capacity based on the size and excrement & sewage generation of standard classroom and teachers temporary dormitory;

3、Septic tanks shall be furnished with seepage prevention measures and bring no pollution to ground water;

4、A rain sewage diversion system shall be established with rainwater harvesting & recycling system and initial rainwater tanks that collect treated rainwater for outdoor greening;

5、Electrical equipment is not recommended to be installed in spaces exposed to high temperature, moisture, dust, fire risk and corrosion, and the installation site shall facilitate inspection, maintenance and disassembly.

6.4.1.2 Environmental Impact Mitigating Measures during Construction Period

Constructors for standard classroom and teacher temporary dormitories in poor remote rural areas shall hold appropriate national engineering construction qualification. Construction and installation works shall be in conformity with construction design documents and technical documents of equipment; for engineering modification, construction shall not be commenced unless modification documents are issued by designer.

I. Dust Contamination Control

Primary source of construction dust: dust from driving vehicles on roads on construction site, from piled building decoration materials and earthworks, from earthwork, muck and construction garbage in transit and from mortar mixing.

For above sources of dust pollution, following dust pollution control measures are provided by the code:

1. Regular watering for dust suppression is necessary for the road prone to cause dust.
2. The material storage area, machining area and large template storage place in the construction site should be flat and solid. Materials should be piled up in compactness to reduce land occupation.
3. The granular materials with fine particle should be kept tightly, and shelters should be equipped during loading and transporting. The remaining dusty materials after removal of composting should be timely cleaned.
4. The exposed area in the construction site should be properly watered for dust suppression.
5. Strengthen the management of transport vehicle. Vehicles entering the construction site should slow down to reduce dust. In addition, the loading space for

the vehicles transporting earthworks, mucks and construction wastes should be properly sealed.

II. Water Pollution Control

Construction wastewater and the domestic sewage from construction personnel constitutes the major part of wastewater produced during construction of standard classroom and teacher temporary dormitories in poor remote rural areas; construction wastewater mainly includes mortar mixing-induced wastewater, foundation pit excavation-induced seepage water, construction machinery cleaning-induced wastewater, and the wastewater containing mechanical oil; the following discharge control measures are proposed for above-noted wastewater:

1. The foundation pit wastewater produced during construction must be treated in sedimentation basin before discharge; therefore, the project is recommended to be furnished with three stages of desilting basin. After the treatment of such impurities as silt in muddy water in desilting basin, the supernatant water is used for construction site or dust laying, while the precipitated mud is used for construction site backfilling.

2. Concrete curing-induced wastewater has high pH value, but the curing water is unlikely to constitute substantive surface runoff that disturbs surface waters by reason that the concrete curing water is easy to evaporate, and that the concrete is normally covered with straw bag and PVC sheet; curing water is recommended to be led to desilting basin and re-used after the neutralization by muddy water.

3. Since machinery and vehicle washing-induced wastewater is usually oily, construction machinery and vehicle is recommended to be cleaned and repaired at neighboring special cleaning or maintenance stations; the oily wastewater or wastes from construction machinery and vehicle cleaned or repaired within project site shall not be disposed of and dumped at discretion, but be collected in containers for recycling to prevent oil pollution. Machinery servicing water and oily wastewater shall not be discharged at discretion, but be reused after oil separation via drainage ditch and small oil separation tank. The mud in sedimentation basin shall be pumped and transported by entrusted organizations. Measures shall be taken not to

contaminate surface water environment, and it shall not be directly discharged into fields and fish ponds.

4. The construction of this project involves surface excavation that may lead to surface disturbance, in which case rainwater may carry mud into the receiving water. Rain wash-induced wastewater on construction site may affect the water quality of receiving water and result in siltation and congestion of surrounding river channels.

5. Construction site is furnished with three-stage septic tanks; the domestic wastewater from construction personnel during construction period is treated in on-site septic tanks and discharged into wastewater treatment plant via municipal piping network after measuring up to the grade-III standard for session II as stated in Discharge Limits of Water Pollutants (DB44/26-2001) of Guangdong Province. If the sewage systems in townships around project site have not been established or are under construction, it's necessary to accelerate the construction of municipal piping network and wastewater treatment plant; in such a case, wastewater from living shall be discharged into surrounding irrigation ditch after being treated in three-stage septic tanks.

6. Drainage channels shall be desilted on a regular basis.

7. Mechanical equipment must be checked for oil or water leakage before use.

8. In order to avoid the pollution to ground water, the foundations of septic tanks and sedimentation basin etc. will be fabricated from anti-seepage cement.

III. Noise pollution control

Noise pollution during the construction period mainly comes from the construction machinery and transport vehicles. Based on the features of noise pollution of public supportive engineering, following control measures are provided by the code:

1. Noise laws and regulations must be observed during construction.
2. Construction time should be strictly kept within 8: 00～20: 00, during lunch break (12:00～14:00) among which, construction shall be ceased. The access time for construction vehicles shall be compliant with requirements of local government.

3. Residents leaving nearby should be informed of continuous construction at night. Go through relevant procedures and take measures to reduce disturbance to residents. Within the noise limit period, construction unit shall receive the effective construction noise permit (CNP).
4. Night construction, if necessary, should be performed within the specified period after getting approval from the competent department. No unauthorized operation of noisy mechanical equipment is allowed.
5. The equipment with noise shall be operated in a closed room.
6. During construction, it is required to ensure there is no abnormal noise and abrasion from the moving gear drives.
7. It is required to use low-noise equipment and close windows and doors as much as possible during construction to reduce influences on people nearby.
8. Contractors should regularly maintain the construction equipment and allow it as much as possible under optimum working condition.
9. Facilities left used have to be shut down or controlled under energy-saving and vibration reduction state.
10. Construction and transportation vehicles are required to slow down and forbidden to toot near the construction site.

IV. Waste control

1. Solid wastes produced during construction period mainly include the construction garbage, dumped oil, chemical solvents and household garbage, among which, the construction garbage is the major solid wastes, mainly containing soil, muck, scattering mortar and concrete, masonry and broken concrete, and the wastes from decoration, sorts of packing materials and other wastes. For those solid wastes from project construction, following waste control measures are provided by the code:

2. Construction and domestic wastes should be separately collected, stored and timely removed as per regulations.

3. Construction wastes should be cleaned daily and forbidden to throw from high.

4. Classify waste generated by construction, dismantle and site clearing, recycle materials that can be used directly or reproducible. Entrust clearance companies to handle the rest. Clearance company must have environmental service quality certificate approved by corresponding department.

5. The dumped oil and chemical solvent should be stored in centralization and treated by the qualified entrusted unit. Do not dump without authorization.

6. Construction equipment should be maintained to prevent oil spillage.

7. All solid wastes produced during construction shall be completely removed upon the completion of engineering project.

V. Key Precautions for Construction

1. Construction of Sedimentation Basin

1) During the construction of cement mortar waterproof layer, its base surface shall be level, clean, hard, rough, fully wet and free of accumulated water.

2) Construction of coating seal layer: The seal layer is provided with corrosion-resistant non-toxic coating with low irritability and excellent leak tightness that could withstand a temperature of at least 80°C. The base surface of seal layer must be free of scum and water, clean and dry.

2. Construction of Septic Tanks

1) In addition to the compliance with structural design drawing, the septic tanks construction quality must comply with requirements on water-tightness, corrosion resistance and frost resistance.

2) Concrete shall be stamped with vibrator to assure compact texture, and the bottom and walls of volume pool shall be subjected to continuous casting to avoid construction joint leakage.

3) In case of over-sized septic tank, expansion joints shall be arranged as required during construction, and water stop strip shall be arranged to avoid temperature change-induced cracking of concrete structure.

4) In case of high groundwater level at septic tank, construction drainage shall be performed in a continuous manner.

5) Where pipeline passes through the main body of septic tank, embedded casing and other water stopping measures shall be taken.

6) In case of concrete defect in septic tank, repairing measures shall be taken timely to avoid volume pool leakage.

VI. Construction safety and others

1. During engineering construction period, the publicity about engineering construction information should be posted at the construction site and surrounding areas so as to inform the public of specific construction activity and time, contact and contact phone number of construction unit as well as get to know the public complaint and suggestion on the construction activity.

2. During structure construction, work closely with professional works involving technology, equipment, pipeline, electricity and instrument, make detailed construction schedule, define responsibilities and construct based on procedure.

3. The constructors working in the dusty site should wear respirator. Personnel engaged in drilling or electric welding shall be equipped with earplug and arc protection goggles.

4. For painting and chemical solvent, it is necessary to select the eco-friendly and non-toxic materials.

6.4.1.3 Environmental Impact Mitigating Measures during Operation Period

I. Water Pollution Control

Domestic wastewater constitutes the main part of wastewater in operation period of standard classroom and teacher temporary dormitories in poor remote rural areas. The pollution control measures are as follows:

1. The drainage piping network of this project is provided with a rain sewage diversion system with rainwater harvesting & recycling system and initial rainwater tanks that collect treated rainwater for outdoor greening; domestic sewage is led to the

nearest wastewater treatment plant via municipal piping network and discharged upon standard compliance; if the surrounding wastewater treatment plant is under construction or there is no wastewater treatment plant around, this project shall be furnished with three-stage septic tanks to meet discharge standard.

2. Sedimentation basins, septic tanks and their pipelines shall be regularly flushed and cleaned to avoid discharging pipeline blockage, feces accumulation and floating objects scab. Operators shall perform regular patrol inspection of sedimentation basins and septic tanks, remove scum in a timely manner, and dispose of spoil on a regular basis based on normal operating conditions.

3. Minimize the cleaning water consumption (for example, using high-pressure low-flow nozzles).

II. Atmospheric Pollution Control

Fetor from public toilets constitutes the main waste gas pollutant during operation period of this project; the atmospheric pollution control measures are as follows:

1. Where possible, the school shall be furnished with flush toilets. Employ natural lighting and ventilation and arrange exhaust pipeline.

2. Toilets in teaching building shall be so arranged that the operation is easy-to-handle, and the environmental hygiene is not impaired.

3. Various organized natural ventilation measures shall be employed to keep indoor CO_2 concentration below 1.5%. The classroom shall be provided with 3 ventilation cycles per hour, while the toilet 10 cycles per hour.

III. Noise pollution control

Major noises during the operation life cycle of the project are derived from mechanical operations such as the operation of generator set and pump station. Following major pollution control measures will be taken for the project:

1. The equipment with noise shall be operated in a closed room.

2. Shock absorption foundation or support as well as damping materials should be prepared for mechanical equipments with big noise.

3. By performing regular maintenance, to keep the construction equipment under the optimum working condition and lowest level of noise as much as possible.

4. Facilities left used have to be shut down or controlled under energy-saving and vibration reduction state.

IV. Solid Wastes Management

Household garbage and septic tank sludge constitute principal solid waste of this project, and household garbage mainly includes paper scraps, peels and plastic, etc. The following solid wastes management measures are proposed based on school-specific characteristics of wastes:

1. Set up sorted garbage recycling bins in project area for classified collection of household garbage like waste paper, metals and glass, and establish corresponding management measures:

1) Establish a sophisticated management system, make clear duties, and perform regular cleaning and collection;

2) Put all garbage in degradable garbage bags;

3) Define rational garbage collection and transportation routes, and take protective measures to minimize garbage spilling during transport.

2. Regular and Timely Removal and Proper Disposal of Solid Wastes

Upon completion of this project, the household garbage produced by teachers, students and other office staff is solid waste for which a garbage collection station shall be set up for regular collection; the collected wastes shall be regularly and timely cleared and transported by environmental sanitation control authorities, and shall be subjected to unified sanitary landfilling or incineration; additionally, environmental sanitation control authorities shall disinfect and kill pests in temporary garbage storage yard on a regular basis.

3. Reinforce the Management, and strictly Prohibit Littering

Make rational arrangement of garbage collection facilities in project area for convenient garbage collection and storage. In addition, it's important to reinforce the management and set up clear sign or guide so as to avoid littering.

4. Define the sludge removal time for septic tanks based on technical standard for septic tank; the septic tanks shall normally be cleared once every 90, 180 or 360 days; the removed sludge could be used as organic fertilizer or for innocent treatment.

6.4.2 Environmental Impact Mitigating Measures for Standard Mobile Laboratories

6.4.2.1 Standardized mobile laboratory Pattern

Standard mobile laboratories are provided with teaching instrument and equipment according to the Equipping Standard of Education Equipment for Mathematics and Science in Primary School (JY/T0388-2006) and the Equipping Standard of Education Equipment for Science Faculty in Junior Middle School (JY/T0386-2006) issued by Ministry of Education; teaching instruments and equipment shall be placed in buses and accompanied by experiment instructors, drivers or transport vehicles for carrying out circuit experiment teaching activities in rural schools so as to address the lack of experiment teaching in remote rural areas.

The school shall file an application for mobile laboratory to local county-level (city/district-level) project management office, which is expected to make allocation and entrust equipment operation and maintenance service providers to deliver mobile laboratories in a timely manner to designated schools. Mobile laboratories are accompanied by experiment teachers, who guide students to carry out the teaching experiments.

The curriculum of the primary and secondary school includes experimental measurement experiment, inquiry-based experiments, demonstration experiment.

Experiment wastewater which including acid, alkali, salt, oxidizing agent or reducing agent generated in the laboratory. Experiment waste which including oxides, potassium permanganate, waste hydrochloride generated in the laboratory

6.4.2.2 Environmental Impact Mitigating Measures during Operation Period

Since this project is purchase service-based, the principal environmental impact occurs in operation period. The following mitigating measures are proposed based on its characteristics:

1. Smooth riding surfaces shall be selected based on properly determined vehicle routes so as to minimize dust emission.

2. Liquid wastes which including acid, alkali, salt, oxidizing agent or reducing agent from lab shall be delivered to the nearest local wastewater treatment plant for final treatment.

3.Standardized mobile laboratory service providers should sign laboratory wastewater treatment contracts with the local WWTPs, and perform the linked list system. Moreover, according to the storage capacity of the laboratory wastewater, sewage should be deliver to the local WWTPs in one or two weeks. Standardized mobile laboratory should keep the treatment receipts for documenting.

4.The WWTPs should provide their discharge ports monitoring data to standardized mobile laboratory annually. Also, the monitoring data provided by the servicers to the counties (cities, districts) Program Offices, need to save as documents.

5. The reagents accidentally damaged during experiment shall be treated in a timely manner to prevent secondary pollution.

6. The experiment garbage produced during test shall be disposed of by qualified organizations.

6.4.3 Summary of environmental impact mitigation measures

Civil engineering mitigation measures are summarized in table 6-1, Standardized mobile laboratory mitigation measures are summarized table 6-2.

6.5 Social impact and mitigation measures

Detailed recommendations for the social impact of the project and possible social risks and social risk control are shown in table 6-3.

Table 6-1 Summary of environmental impact mitigation measures-civil work

Project stage	Environmental problems	Mitigation and protection measures
Design Period	Requirements on Site Selection	1）Address the teaching requirements of schools with poor compulsory education to the greatest extent in a convenient and practical manner 2）Standardized classrooms functionally meet practical needs of project object, and that the project development could mitigate such issues as "insufficient teaching space" and "large class quota" to a greater extent. 3）All procedures required have been handled; the use of land involves no land acquisition, relocation and land dispute (project school is expected to provide a certificate stamped by county-level (city/district-level) land administration authorities), and complies with local planning. 4）The project is carried into execution through open bidding. 5）Each standard classroom has a floor area of 100m2; the plan layout shall be square and regular to the greatest extent; unilateral corridor shall be used for energy efficiency whenever possible. 6）The design shall be concise, generous and cost-effective to the extent where the design is compatible with existing buildings of project object. 7）Decoration design shall reflect the control over cost-effectiveness and functional applicability; the selection of material shall incarnate the focus wherever possible; secondary parts shall be made from mid-low-end materials. 8）Exterior works mainly include the works of outdoor water supply and drainage, power supply and communication etc. required within scope of buildings, as well as the roads, squares, greening and site grading, etc. 9）The design life of main frame structure (no steel structure is allowable; no brick-concrete structure is allowable in principle) is 50 years. 10）The seismic fortification intensity could be a grade higher than the specified intensity for Guangdong Province; alternatively, higher-level seismic fortification measures could be employed at the same grade.

Project stage	Environmental problems	Mitigation and protection measures
		11）The water supply and sewerage works in buildings should make the most of existing water source and drainage system . Electric power works within buildings shall make the most of existing power supply system in principle.
	Design Requirements	1）Where there are WWTP and municipal pipe network around the school, the domestic sewage shall be led via municipal piping network to wastewater treatment plant for proper treatment during operation period; provided that the urban wastewater system around school has not been established or is under construction, the development of municipal piping network and wastewater treatment plant shall be accelerated, while domestic sewage shall be disposed of with three-stage septic tanks; 2）Three-stage septic tanks shall be designed with septic tanks with adequate capacity based on the size and excrement & sewage generation of standard classroom and teachers temporary dormitory; 3）Septic tanks shall be furnished with seepage prevention measures and bring no pollution to ground water； 4）A rain sewage diversion system shall be established with rainwater harvesting & recycling system and initial rainwater tanks that collect treated rainwater for outdoor greening 5）Electrical equipment is not recommended to be installed in spaces exposed to high temperature, moisture, dust, fire risk and corrosion, and the installation site shall facilitate inspection, maintenance and disassembly.
Construction Period	Water Pollution	1）The water from pit excavation and the waste water for mortar mixing can be recycled after sedimentation treatment for construction or watering to reduce dust. 2）Construction waste water should not be discharged at will, and the waste water from mechanical cleaning can be reused. 3）It is required to regularly dredge the drainage channel. 4）To prevent oily sewage in the construction site from maintenance, the construction machine and vehicle should be maintained at the professional maintenance point. 5）Mechanical equipment before using should be inspected for oil or water leakage. 6）Construction site is furnished with three-stage septic tanks; the domestic wastewater from construction personnel during construction period is treated in on-site septic tanks and discharged into wastewater treatment plant via municipal piping network after

Project stage	Environmental problems	Mitigation and protection measures
		measuring up to the grade-III standard for session II as stated in Discharge Limits of Water Pollutants (DB44/26-2001) of Guangdong Province. If the sewage systems in townships around project site have not been established or are under construction, it's necessary to accelerate the construction of municipal piping network and wastewater treatment plant; in such a case, wastewater from living shall be discharged into surrounding irrigation ditch after being treated in three-stage septic tanks.
	Air pollution	1）Regular watering for dust suppression is necessary for the road prone to cause dust. 2）The material storage area, machining area and large template storage place in the construction site should be flat and solid. 3）The granular materials with fine particle should be kept tightly, and shelters should be equipped during loading and transporting. 4）The exposed area in the construction site should be properly watered for dust suppression. 5）Vehicles entering construction site should slow down. 6）The loading space for the vehicles transporting earthworks, mucks and construction wastes should be properly sealed.
	Noise pollution	1）It is required to carry out construction within the specified period. 2）Residents leaving nearby should be informed of continuous construction at night. 3）Within the noise limit period, construction unit shall receive the effective CNP. 4）During construction, it is required to ensure there is no abnormal noise and abrasion from the moving gear drives. 5）It is required to use low-noise equipment and close windows and doors as much as possible during construction. 6） Regularly maintain the construction equipment and allow it as much as possible under optimum working condition. 7） Facilities left used have to be shut down or controlled under energy-saving and vibration reduction state. 8）Construction and transportation vehicles are required to slow down and forbidden to toot near the construction site.
	Solid waste pollution	1）Construction and domestic wastes should be separately collected, stored and timely removed as per regulations. 2）Construction wastes should be cleaned daily and forbidden to throw from high. 3）Garbage collection unit shall hold the environmental service certificate issued by relevant department.

Project stage	Environmental problems	Mitigation and protection measures
		4）The dumped oil and chemical solvent should be stored in centralization and treated by the qualified entrusted unit. 5）All solid wastes produced during construction shall be completely removed upon the completion of engineering project.
	Construction safety and others	1） The coating selected for sealing layer should be less corrosive, irritating, non-toxic and excellent in sealing performance. 2）The publicity about engineering construction information should be posted at the construction site and surrounding areas. 3）The constructors working in the dusty site should wear respirator. 4）Personnel engaged in drilling or electric welding shall be equipped with earplug and arc protection goggles. 5）For painting and chemical solvent, it is necessary to select the eco-friendly and non-toxic materials.
Operation period	Water pollution	1）The drainage system should be designed with separate rainwater and sewage collection & transport system. 2）Initial rainwater tanks that collect treated rainwater for outdoor greening. 3）Domestic sewage is led to the nearest wastewater treatment plant via municipal piping network and discharged upon standard compliance. 4）if the surrounding wastewater treatment plant is under construction or there is no wastewater treatment plant around, this project shall be furnished with three-stage septic tanks to meet discharge standard. 5）Sedimentation basins, septic tanks and their pipelines shall be regularly flushed and cleaned to avoid discharging pipeline blockage, feces accumulation and floating objects scab.
	Air pollution	1）Where possible, the school shall be furnished with flush toilets. 2）Employ natural lighting and ventilation and arrange exhaust pipeline.
	Noise pollution	1）Major noises during the operation life cycle of the project are derived from mechanical operations such as the operation of generator set and pump station. Following major pollution control measures will be taken for the project: 2）The equipment with noise shall be operated in a closed room. 3）Shock absorption foundation or support as well as damping materials should be prepared for mechanical equipments with big noise.

Project stage	Environmental problems	Mitigation and protection measures
		4）By performing regular maintenance, to keep the construction equipment under the optimum working condition and lowest level of noise as much as possible.
	Solid waste pollution	1）Set up sorted garbage recycling bins in project area for classified collection of household garbage like waste paper, metals and glass, and establish corresponding management measure. Put all garbage in degradable garbage bags. 2）Regular and Timely Removal and Proper Disposal of Solid Wastes. 3）Reinforce the Management, and strictly Prohibit Littering. 4）Regular cleaning of septic tanks.

Table 6-2 Summary of environmental impact mitigation measures-standardized mobile laboratory

Project stage	Environmental problems	Mitigation and protection measures
Operation period	Water pollution	1）Experiment wastewater which including acid, alkali, salt, oxidizing agent or reducing agent generated in the laboratory shall be delivered to the nearest local wastewater treatment plant for final treatment. 2）Standardized mobile laboratory service providers should sign laboratory wastewater treatment contracts with the local WWTPs, and perform the linked list system. Moreover, according to the storage capacity of the laboratory wastewater, sewage should be deliver to the local WWTPs in one or two weeks. Standardized mobile laboratory should keep the treatment receipts for documenting. 3） The WWTPs should provide their discharge ports monitoring data to standardized mobile laboratory annually. Also, the monitoring data provided by the servicers to the counties (cities, districts) Program Offices, need to save as documents.
	Air pollution	Smooth riding surfaces shall be selected based on properly determined vehicle routes so as to minimize dust emission
	Solid waste pollution	1）The reagents accidentally damaged during experiment shall be treated in a timely manner to prevent secondary pollution. 2）The experiment garbage produced during test shall be disposed of by qualified organizations.

Table 6-3 Project Impact, Potential Social Risks and Control Measures and Suggestions

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
High quality education resources sharing pilot program	Sub-item 1: "Ban Ban Tong" teaching platform and its maintenance Sub-item 2: Online classroom at teaching stations and its maintenance Sub-item 3: Education teaching information management system and its maintenance Sub-item 4: Digital	(1) Project school (2) The principal and teachers (3) Students and their parents	(1) Improve infrastructure, teaching conditions and faculty for counties with poor performance for compulsory education. (2) Enable underdeveloped areas to share high quality teaching resources of developed areas. (3) Increase equipment information management professionals. (4) Help to promote the integration of information technology and teaching, improve the	(1) Project feasibility (2) Risks about future management and service of this project (1) Source of support funding (2) Support forms (3) Support effect evaluation	(1) Develop different plans for schools at mountainous areas and urban schools. in view of poor traffic conditions and terrain conditions as well as other natural geographical conditions unfavorable for the access of network and optical fiber, adopt other alternatives for internet access. (2) Due to large time span of the project and since cost for internet access is currently assumed by schools in full, the project will provide part of network traffic fee and future equipment maintenance costs. (3) Establish professional training system to train older teachers on multimedia use skills and others. In future maintenance and management process, it is necessary to specify rights and obligations of organizations and their specific functions.

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
	education resources development		level of education modernization and information.		
	Sub-item 5: school counterpart system research and pilots		(5) Increase communication with experienced teachers and get inspired in teaching ideas. (6) Help to reduce difference in level of education, teaching and management in rural areas, urban areas and different areas. (7) Help to optimize allocation of education resources so as to promote balanced development of education between urban and rural areas from the perspective of		(1) It is advised to take the form of one-to-one communication. Through in-depth study and experience exchange between experienced teachers and backbone teachers of the school, improve training efficiency and quality. (2) Develop measures on the use of support funds. establish the support fund management system and specify responsibilities of related organizations as well as management measures. (3) It is advised to have personalized and one-to-one evaluation and examination to teachers participating in the support program by means of questionnaires completed by students and others.

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
			structure.		
School standardization construction pilot program	Sub-item 6: Standardized classroom	(1) The principal and teachers (2) Project school (3) Students at remote arduous rural areas and their parents	(1) Help to solve problems of deficiency of classrooms and "oversized class" in counties with poor performance on compulsory education. (2) Relieve deficiency of teaching laboratory and experimental apparatus in counties with poor performance on compulsory education to some degree and increase practice opportunities of students. (3) Improve housing environment for teachers in counties	(1) Risks relating to project construction (2) Risks caused by demolition and temporary resettlement (3) Risks about future management and service of this project	(1) It is suggested to involve stakeholders in classroom design stage to participate actively and listen to suggestions of students, teachers other direct benefited groups. (2) According to field investigation, some schools and students advise to leave the first floor of the classroom building unoccupied as activity venue.
	Sub-item 7: Standardized mobile laboratory			(1) Risk about resource allocation (2) Risks about future management and service of this project	It is suggested to build more laboratories at project sites and recruit more professional laboratory teachers. Strengthen training of full-time laboratory technicians so as to meet needs.
	Sub-item 8: Teacher turnover			(1) Risks about construction and temporary	(1) It is advised to develop a set of fair, just and transparent allocation system with supervision mechanism in the future. The social assessment team

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
	dormitory in remote arduous rural areas		with poor performance on compulsory education so as to improve their teaching efficiency and enthusiasm.	resettlement (2) Risks about future management and service (3) Risk about resource allocation (4) Risks about future management and service of this project	advises to allocate based on whether the teacher has a house and give priority to teacher working at local place. At present, priority is given to teachers without house, lack of house and living far away from the school. (2) Simple interior decoration is recommended to facilitate future centralized and unified management. Future maintenance and use costs will be assumed by the school and the teacher.
Quality-oriented education experimental pilot program	Sub-item 9: Classroom teaching reform experiment program	(1) The principal and teachers (2) Project school (3) Students and their parents	(1) Reform education ideas and means. (2) Provide students with more opportunities of extracurricular activities, improve their learning interest and relieve their strong dislike of school. (3) Improve	(1) Lack of incentive mechanism (2) Future monitoring and evaluation	(1) It is advised to set up detailed and differentiated evaluation criteria. Design diversified teaching contents based on features of the place where the school is located. (2) Set up objective evaluation mechanism and proper teach incentive mechanism, i.e., material reward, to improve teachers' work enthusiasm. (3) For teaching evaluation and daily assessment, it is proposed to develop differentiated assessment system based on actual situation about teacher configuration and education quality of schools at mountainous

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
			compulsory education enrollment rate and reduce school dropout.		areas and reduce exam difficulties appropriately.
	Sub-item 10: Rural quality-oriented education experimental schools			(1) The content of quality education reform is not clear (2) Teachers' enthusiasm is low (3) How to develop the supervision, and how to develop a scientific evaluation criterion	(1)For students in remote mountainous areas and ethnic minority students, this project should focus on strengthening education contents about national culture, local culture and local culture, add related courses and provide related teaching materials so as to enhance self-confidence in national culture. (2) To perfect the related system and method design. (3)To develop reasonable regulation on educational funds usage, so as to promote teachers' positivity in teaching jobs
Teacher resource optimized configuration pilot program	Sub-item 11: Rural primary school full-discipline teacher training standard research and	(1) Principals and teachers in the project county (2) Junior middle school students in school (3) Students'	(1) Help to solve problems of faculty deficiency and unreasonable teacher structure in counties with poor performance on compulsory	(1) Recruitment and publicity (2) Future management and sustainable development (3) Teacher	(1) It is suggest refining detailed rules on the propaganda, application, enrollment, employment, establishment and others for the construction of full-discipline new teachers for primary schools. (2) Define responsibilities of various departments to prevent problems of insufficient enrollment in early stage and failure for proper settlement of talents in

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
	training base construction	parents (4) Students	education. (2) Promote communication between experienced teachers at developed areas and teachers at underdeveloped areas and improve teaching levels of existing teachers. (3) Improve the problem of uneven level of existing teachers.	training and work on regular post (4) Risks about subsequent supervision and evaluation as well as sustainable development	the later stage.
	Sub-item 12: Primary school full-discipline new teacher construction program				
	Sub-item 13: Ability enhancement of principals and backbone teachers			(1) Teacher training and work on regular post (2) Risks about subsequent supervision and evaluation as well as sustainable development	(1) Centralized and off-site training for teachers is recommended. In this way, it will be more convenient for the school for uniform arrangement and management of teacher training and work on regular posts. Besides, opportunities for field visit to developed areas may also be obtained. (2) It is advised to develop differentiated training contents and evaluation standards based on specific demands on training of teachers at different areas (rural or urban areas).
	Sub-item 14: Full-discipline teaching ability enhancement for teachers in village primary schools and teaching				

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
	stations				
	Sub-item 15: school teacher training on the application of "Ban Ban Tong" program				
Pilot program for the guarantee of education for special groups	Sub-item 16: Rural left-behind children family education system research and pilot	(1) Left-behind children and disabled students (2) The principal and teachers (3) Students' parents	(1) Improve the left-behind children care service system and enhance education of left-behind children, especially psychological education resources. (2) Improve mental health state of left-behind children. (3) Increase resources of regular schools on learning in regular	(1) Problems of traditional concepts (2) Security of disabled students in the school (3) Influence on performance of teachers	(1) Education sectors may cooperate with women's federation organizations or non-governmental organizations and seek for cooperation and support from multiple social organizations. (2) Schools are recommended to open interest classes and increase time for extracurricular activities. (3) Schools are recommended to configure special teachers to take charge of education, teaching and management of left-behind children. Ensure range of activity of left-behind children during the trusteeship and reduce the number of times for them to go to internet cafe.
	Sub-item 17: Exceptional				(1) To implement this project, it is recommended to consider special hardware facilities needed for the

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
	children learning in regular class system research and pilot		classes of special groups. (4) Help to establish a reasonable school enrollment system for disabled students and help them to be integrated in society as far as possible.		education of disabled students and configure and get ready such facilities. (2) For course design, course teachers should have sufficient communication and consultation with professional teachers for special education so as to ensure that needs of disabled students can be guaranteed by classroom teaching as far as possible. (3) Increase reading or extracurricular activities so as to increase opportunities for disabled students to participate in collective activities. (4) Look for partners for disabled students and establish the partnership system to enhance communication and understanding among students.
Education quality management pilot program	Sub-item 18: participate in compulsory education quality test organized by the province	(1) Related schools (2) Teachers	(1) Form incentives for teachers and improve pertinence and efficiency of teachers' work. (2) Facilitate objective evaluation of education and teaching effect and realize	Whether the evaluation index design is scientific	(1)To perfect the evaluation system and index design. (2)To develop the evaluation system and standards for differentiation based on concrete development level in different project counties(cities, districts).

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
			targeted weakness improvement.		
Project management and ability enhancement promote the pilot program	Sub-item 19: Research and formulation of relevant standards Sub-item 20: Training on project managers Sub-item 21: Project monitoring and management	(1) Project implementing agencies (2) Project managers	Help the project organization to learn project experience on aspects of the management system, system ability and external monitoring.	Whether project implementing agencies can learn project management mode and related management experience effectively, and to perform this during the process of the whole project	(1)To improve and strengthen the construction of organizations, to clarify the responsibility of different levels of organizations and officials in every organizations. (2)To improve the design of related insititutions in detail, so as to improve the efficiency of persons and institutions. (3)To improve the detection mechanism.
Research on the social donation for education management system	Sub-item 22: Research on the social donation for education management system	(1) Project implementation unit (2) Social donors (3) Related schools, teachers and students (4) Other	(1) Promote to form benign interaction between the recipients and donors and strengthen their communication. (2) Help to form good		

Project type	Project name	Group to be positively affected	Positive impact of the project	Potential social risks of this project	Control Measures and Suggestions
		participating departments	social donation environment.		

Chapter VII Environmental Monitoring Plan

Environmental monitoring shall be performed during operation period so as to assure environmental protection in project implementation area, verify the result of environmental impact prediction & assessment, prevent adverse effect of sudden accident on the environment, and develop detailed environmental protection measures implementation plan. Environmental monitoring could provide scientific basis for environmental pollution control, environmental management and regional environmental protection in operation periods of project. Environmental monitoring plan for operation period see the table as below.

Table 7.1 Environmental monitoring plan for operation period

No.	Monitoring item	Monitoring point	Monitoring (observation) indicator	Monitoring frequency	Monitoring sampling and analysis methods	Implementing body	Organization in charge	Supervision organization
1	Water pollution sources monitoring (suitable for mobile experiment truck)	16 county WWTPs	COD, ammonia nitrogen, pH, suspended matter, BOD_5, total phosphorus, animal and vegetable oils, and heavy metal etc.	Project monitoring body performs daily monitoring, for which the recommended interval is half a year.	Technical Specification for Environmental Monitoring and Technical Specification for Monitoring of Surface Water and Waste Water	Organization or monitoring station qualified for monitoring	Standardized mobile laboratory service	County-level (city/district-level) environmental protection bureau
Note：Standardized mobile laboratory service providers should sign laboratory wastewater treatment contracts with the local WWTPs, and perform the linked list system. The WWTPs should provide their discharge ports monitoring data to standardized mobile laboratory annually (monitoring target as above), this fee is included in purchase standardized mobile laboratory service fee.								

Chapter VIII Information management for environmental management plan

8.1 Exchange of information

Environmental management requires necessary exchange of information among different departments and posts in the project department, the owners, contractors and operators, and also the report relevant information to the outsider (relevant party and social public). Internal exchange of information may be achieved in many ways like the meeting and internal brief report, while once formal meeting a month is necessary to keep all exchanged information in record and archives. External exchange of information should be conducted once every six months or a year, the exchange of information with cooperative units should be kept in records.

8.2 Recording mechanism

To ensure the effective operation of environmental management system, it is required to establish a complete recording system and maintain records in following aspects:

(1) Law and regulation requirements;

(2) Permit;

(3) Environmental factor and related environmental impact;

(4) Training;

(5) Check, verification and maintenance activity;

(6) Monitoring data;

(7) Effectiveness of corrective and preventive measures;

(8) Information of interested party;

(9) Examination and verification;

(10) Review.

In addition, it is required to conduct necessary control for above records, including the identification, collection, catalog, archiving, save, management, maintenance, inquiry, storage period and disposal of records.

8.3 Reporting mechanism

During construction, the contractor, operator, monitoring unit, environmental supervising engineer and project management office should keep record of the project progress, EMP implementation and environmental monitoring result and timely report to the related department. It mainly consists of following six parts:

(1) Environmental supervising engineer will keep detailed monthly record of the implementation of EMP and timely submit the weekly and monthly report to the PO and the project management office of each county; the weekly and monthly report should cover the implementation of EP measures, the progress of environmental monitoring and monitoring data.

(2) The contractor and operator will keep detailed quarterly record of the implementation of EMP and timely submit the quarterly report to each county project management office as well as report to the county (city, district) environmental protection bureau.

(3) The monitoring unit will, after completion of the entrusted monitoring task, timely submit monitoring report to the contractor (operator) and environmental supervising engineer.

(4) The project management office of each county (city, district) level will timely submit the project progress report to the project management office of provincial level and to the Department of Environmental Protection of Guangdong Province(DEP) as well. The project progress report (such as monthly, quarterly and annual report) should be cover the progress of EMP, like the implementation effectiveness and working progress of EMP, particularly the environmental monitoring result.

(5) In case of any severe violation in the aspect of EP, the environmental supervising engineer and project department should report the local administrative department in charge of EP, and if necessary, report the case level by level.

(6) The annual EMP implementation report of project shall be completed and submitted to the WB prior to March 31 of the coming year. EMP implementation report should cover following contents:

a. Implementation of training plan;

b. Project progress;

c. The implementation of EP measures, environmental monitoring and major monitoring results;

d. If there is any public complaint, if any, record its details, solution and public satisfaction;

e. EMP implementation plan of the next year.

8.4 Document management

During the implementation of Environmental Management Plan, the corresponding documents shall be subject to the management by WB, and PMOs at provincial and county level as well as EIA unit, engineering PS and the unit in charge of construction.

Table 8-1 Document management requirement for organizations

Name of organization	Document management
①The unit in charge of construction.	1. Keep weekly record of project implementation and keep them on file, report to the engineering PS; 2. Together with the engineering PS, complete the construction site inspection form prior to construction, keep them on file and report the project management office at county (city/district) level; 3. In case of emergency and accident, record the detailed implementation of works, keep them on file and report to the engineering PS; 4. Complete rectification within 3 working days upon receipt of rectification notice (10 working days when the coordination from management organization is

Name of organization	Document management
	necessary), and keep them on file.
② Engineering PS	1. Keep weekly record of the reports from construction unit, keep them on file and report to the project management office at county (city/district) level; 2. Together with the construction unit, complete the construction site inspection form prior to construction, keep them on file and report to the project management office at county (city/district) level; 3. In case of emergency and accident, record the detailed implementation measures taken by the construction unit, keep them on file and report to the project management office at county (city/district) level; 4. Put forward rectification program and solution in response to the environmental problems construction unit face in the construction, and follow up the implementation, including the issuance of the rectification notice and rectification check sheet and archiving of examination documents.
③ The unit with Class A Qualification Certificate and qualified to assess environmental impact of construction project and	1. Compile the Environmental Management Plan, keep the first draft, the draft for review and the approved version on file.
④ Project management offices at country (city, district) level	1. Organize study or relevant research, manage and keep on file the working documents regarding the seminar and research; 2. Complete the recording, management and archiving of complaints in the engineering construction and operation; 3. Keep quarterly record of the reports from engineering PS, keep them on file and report to the project management office at provincial level; 4. Sign for the construction site inspection form submitted by the construction unit and engineering PS, confirm the environmental sensitive issues and keep them on file; 5. Keep record of the rectification notices and keep them on file.
⑤ PMO at provincial level	1. Compile and supervise the implementation of Environmental Management Plan, keep them on file;

Name of organization	Document management
	2. Keep record of reports from PMOs at county level once half a year, report to the WB and keep them on file; 3. Along with other related departments, provide solutions to the major environmental problems, keep record of the detailed measures and keep them on file;
⑥ WB	1. Keep record of reports from PMO at provincial level once half a year, and keep them on file;

Chapter IX Public Participation

9.1 Purpose of public participation

Public participation and information disclosure represents the two-way communication between the project proponent and the public by EA, also plays an important role in the EIA for construction project, significantly crucial for making decision for improvement. It aims to make project-related information public to the project area and the public concerning the engineering construction, allow them aware of major engineering-related information, construction and operation feature and the engineering-related environmental problems of great significance; help assessment professional find problems, confirm that the environmental problems of great significance arising from the engineering have been analyzed and assessed through the environmental management plan; and confirm the feasibility of EP measures and the implementation and enforcement of optimization measures. Public consultation lays stress on the contact and communication between project parties and the public, since it can directly reflect the public opinion, help decision making department with timely discovery of potential problems, timely revision and improvement of design plan so as to provide practical solution to the problems of public concern, achieve more perfect and rational project planning, design and environmental monitoring and management, as well as realize the optimal environmental, social and economic benefit.

9.2 Consultation method and content

In accordance with the PRC Environmental Impact Assessment Law, and the Temporary Methods of Public Consultation for EIA issued by the Ministry of Environmental Protection as well as the Operational Policy (OP4.01) of the WB, we have completed two rounds of public consultation and information disclosure during assessment. The first was carried out after the screening of environmental problems,

prior to the final confirmation of working outline for EA, and the second was carried out in the completion stage of initial drafting of environmental assessment report.

9.2.1 Consultation methods

The major ways of public participation in consultation include:

(1) Convene forums in the project areas;

(2) Pay a visit to the public in the project areas;

(3) General survey of public opinion is made by questionnaires.

(4) Non-government organization: forums or telephone interviews.

9.2.2 Consultation Content

(1) Content of panel discussion and the masses interview

Panel discussion is organized to inform participants of project construction details and the primary coverage of environmental protection, and give audience to their opinions and comments on project development and environmental protection.

(2) Principal content of questionnaire survey (see Table 5-7)

9.3 Public Opinions and Suggestions

9.3.1 Summary of Public Survey on EMP

Table 9-1 Summary of public survey

Time	Form	Place	Consultation object	Content
December 23, 2015 - January 6, 2016	The first public announcement online	Public websites of developer, EIA organization, and education bureau of each county (city/district)	Stakeholders	Announcement of information about public participation in environmental management planning for World Bank Loan Guangdong Compulsory Education Project
January 15, 2016	Panel discussion	Bureau of Education of Wengyuan County	Responsible officers from the county-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 15, 2016	Post proclamation	Bureau of Education of Wengyuan County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 16, 2016	Site visit	Jiangwei Township Central Primary	Managerial personnel, teachers and students of	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household

Time	Form	Place	Consultation object	Content
		School, Wengyuan Yimin Wastewater treatment plant, Nantang Township	Jiangwei Township Central Primary School, students' parents, the residents involved, and the administrative authorities of municipal piping network	garbage and surrounding sensitive points, interact with stakeholders, etc.
January 18, 2016	Panel discussion	Bureau of Education of Luoding City	Responsible officers from the city-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 18, 2016	Post proclamation	Bureau of Education of Luoding City	/	Put up project bulletin on the bulletin board of the city-level bureau of education
January 19, 2016	Site visit	Luoding Chinese High School	Managerial personnel, teachers and students of Luoding Chinese High School, students' parents, and	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.

Time	Form	Place	Consultation object	Content
			residents involved	
January 19, 2016	Panel discussion	Bureau of Education of Dianbai County	Responsible officers from the county-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 19, 2016	Post proclamation	Bureau of Education of Dianbai County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 20, 2016	Site visit	Dianbai Tianchong Primary School	Managerial personnel, teachers and students of Dianbai Tianchong Primary School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 20, 2016	Panel discussion	Bureau of Education of Lufeng County	Responsible officers from the county-level bureau of education, the development	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about

Time	Form	Place	Consultation object	Content
			and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	surrounding residents, and give audience to competent authorities' comments on the project.
January 20, 2016	Post proclamation	Bureau of Education of Lufeng County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 21, 2016	Panel discussion, site visit	Lufeng Neihu Middle School, and Lufeng Tanxi Second Middle School	Managerial personnel, teachers and students of Lufeng Neihu Middle School and Tanxi Second Middle School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, organize panel discussion, etc.
January 20, 2016	Panel discussion	Bureau of Education of Wuchuan City	Responsible officers from the city-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.

Time	Form	Place	Consultation object	Content
			(residential areas involved), as well as members of county-level project management office	
January 20, 2016	Post proclamation	Bureau of Education of Wuchuan City	/	Put up project bulletin on the bulletin board of the city-level bureau of education
January 21, 2016	Site visit	Wuchuan Huangpo Primary School and Tangzhui Primary School	Managerial personnel, teachers and students of Wuchuan Huangpo Primary School and Tangzhui Primary School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 21, 2016	Panel discussion	Bureau of Education of Huzhou City	Responsible officers from the city-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.

Time	Form	Place	Consultation object	Content
January 21, 2016	Post proclamation	Bureau of Education of Huzhou City	/	Put up project bulletin on the bulletin board of the city-level bureau of education
January 22, 2016	Site visit	Huazhou Tongqing Middle School	Managerial personnel, teachers and students of Huazhou Tongqing Middle School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 21, 2016	Panel discussion	Bureau of Education of Huilai County	Responsible officers from the county-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 21, 2016	Post proclamation	Bureau of Education of Huilai County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 22, 2016	Site visit	Huilai Xian'an Primary School	Managerial personnel, teachers and students of	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household

Time	Form	Place	Consultation object	Content
			Huilai Xian'an Primary School, students' parents, and residents involved	garbage and surrounding sensitive points, interact with stakeholders, etc.
January 22, 2016	Panel discussion	Bureau of Education of Lianjiang City	Responsible officers from the city-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 22, 2016	Post proclamation	Bureau of Education of Lianjiang City	/	Put up project bulletin on the bulletin board of the city-level bureau of education
January 23, 2016	Site visit	Lianjiang Liangdong Middle School, Watsons Chunlei Primary School, and Liangdong Junior High School	Managerial personnel, teachers and students of Lianjiang Liangdong Middle School, Watsons Chunlei Primary School and Liangdong Junior High School, students' parents, and	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.

Time	Form	Place	Consultation object	Content
			residents involved	
January 22, 2016	Panel discussion	Bureau of Education of Puning City	Responsible officers from the city-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 22, 2016	Post proclamation	Bureau of Education of Puning City	/	Put up project bulletin on the bulletin board of the city-level bureau of education
January 23, 2016	Site visit	Puning Yuxiu Middle School	Managerial personnel, teachers and students of Puning Yuxiu Middle School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 23, 2016	Panel discussion	Bureau of Education of Suixi County	Responsible officers from the county-level bureau of education, the development	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about

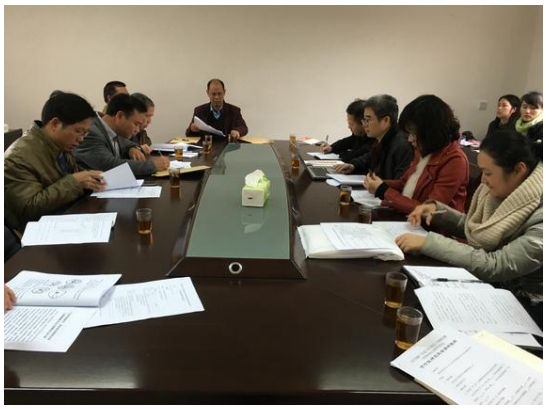
Time	Form	Place	Consultation object	Content
			and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	surrounding residents, and give audience to competent authorities' comments on the project.
January 23, 2016	Post proclamation	Bureau of Education of Suixi County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 24, 2016	Site visit	Suixi Leilin Middle School	Managerial personnel, teachers and students of Suixi Leilin Middle School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 23, 2016	Panel discussion	Bureau of Education of Jiexi County	Responsible officers from the county-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved),	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.

Time	Form	Place	Consultation object	Content
			as well as members of county-level project management office	
January 23, 2016	Post proclamation	Bureau of Education of Jiexi County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 24, 2016	Site visit	Jiexi No.4 Huaqiao Middle school	Managerial personnel, teachers and students of Jiexi No.4 Huaqiao Middle school , students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 24, 2016	Panel discussion	Bureau of Education of Leizhou City	Responsible officers from the city-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 24, 2016	Post proclamati	Bureau of Education of Leizhou City	/	Put up project bulletin on the bulletin board of the city-level bureau of education

Time	Form	Place	Consultation object	Content
	on			
January 25, 2016	Site visit	Leizhou Zhujia Chuntao Primary School	Managerial personnel, teachers and students of Leizhou Zhujia Chuntao Primary School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 24, 2016	Panel discussion	Bureau of Education of Chaoyang District	Responsible officers from the district-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 24, 2016	Post proclamation	Bureau of Education of Chaoyang District	/	Put up project bulletin on the bulletin board of the district-level bureau of education
January 25, 2016	Site visit	Chaoyang Zaopu Middle School	Managerial personnel, teachers and students of	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household

Time	Form	Place	Consultation object	Content
			Chaoyang Zaopu Middle School, students' parents, and residents involved	garbage and surrounding sensitive points, interact with stakeholders, etc.
January 25, 2016	Panel discussion	Bureau of Education of Chao'an District	Responsible officers from the district-level bureau of education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	Learn about local education background and current environmental status, inquire about project progress, learn about environmental protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 25, 2016	Post proclamation	Bureau of Education of Chao'an District	/	Put up project bulletin on the bulletin board of the district-level bureau of education
January 26, 2016	Site visit	Chao'an Dazhai Middle School	Managerial personnel, teachers and students of Chao'an Dazhai Middle School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.
January 28, 2016	Panel discussion	Bureau of Education of Wuhua County	Responsible officers from the county-level bureau of	Learn about local education background and current environmental status, inquire about project progress, learn about environmental

Time	Form	Place	Consultation object	Content
			education, the development and reform bureau, the bureau of finance, the environmental protection bureau and the village committees (residential areas involved), as well as members of county-level project management office	protection facilities construction details and the information about surrounding residents, and give audience to competent authorities' comments on the project.
January 28, 2016	Post proclamation	Bureau of Education of Wuhua County	/	Put up project bulletin on the bulletin board of the county-level bureau of education
January 29, 2016	Site visit	Wuhua First Primary School	Managerial personnel, teachers and students of Wuhua First Primary School, students' parents, and residents involved	Identify the present status of environment, check if there is any wastewater treatment plant, learn about the destination of household garbage and surrounding sensitive points, interact with stakeholders, etc.



a. Panel discussion at Bureau of Education of Wengyuan County

b. Wengyuan Yimin Wastewater treatment plant

c. Proposed location of teacher temporary dormitory for Jiangwei Township Central Primary School in Wengyuan County

d. Public participation at Jiangwei Township Central Primary School in Wengyuan County

e. Sensitive points around Jiangwei Township Central Primary School in Wengyuan County - Nantang Township

f. Sewage connection of Jiangwei Township Central Primary School with municipal piping network of Wengyuan County

g. Panel discussion at Bureau of Education of Lufeng County

h. Panel discussion and questionnaire filling at Neihu Middle School in Lufeng County

i. Proposed location of teacher temporary dormitory for Neihu Middle School in Lufeng County

j. Proposed location of standard classroom for Neihu Middle School in Lufeng County

k. Panel discussion at Tanxi Second Middle School in Lufeng County

l. Panel discussion at Bureau of Education in Huilai County

m. Panel discussion and questionnaire survey at Huilai Xian'an Primary School

n. Proposed location of project for Huilai Xian'an Primary School

o. sensitive point of Huilai Aojiang middle school - Macao village

p. sensitive point of Huilai Qishi middle school - Qishi nursing home

q. sensitive point of Huilai Xian'an middle school - Xian'an Hospital

r. Panel discussion at Bureau of Education of Chao yang District

s. sensitive point of Chaoyang Chenlin middle school - kindergarten

t. Panel discussion at Bureau of Education of Chao'an District

u. Site investigation at Chao'an Dazhai Middle School

v. sensitive point of Fuyang Liulian primary school at Chaoyang District-Fuyang center kindergarten

w. Questionnaire survey at Wuhua First Primary School

x. Site investigation at Wuhua First Primary School

y. Panel discussion at Bureau of Education of Dianbai District

z. Proposed location of project for Tianchong Primary School in Dianbai District

1. Proposed location of temporary dormitory for Tianchong Primary School in Dianbai District

2. Panel discussion and questionnaire survey at Tianchong Primary School in Dianbai District

3. sensitive point of Magang center primary school at Dianbai District- Magang Hospital

4. sensitive point of Ma Gang center primary school at Dianbai District- Ma Gang neighborhood committee

5. sensitive point of Wangfu center primary school at Dianbai District- Wangfu Hospital

6. sensitive point of Wangfu center primary school at Dianbai District- Wangfu middle school

7. Panel discussion at Bureau of Education of Huazhou City

8. Panel discussion and questionnaire survey at Huazhou Tongqing Middle School

9. sensitive point of Panyang middle school at Huazhou city- Xiesha village

10. sensitive point of Daqiao centre primary school at Huazhou city- Daqiao Hospital

11. sensitive point of Lingjiang primary school at Huazhou city- residence community(Yijing community)

12. sensitive point of Yangjia primary school at Leizhou city- Yangjia center kindergarten

13. sensitive point of Longmen middle school at Leizhou city- Xiao jing ling kindergarten

14. Panel discussion at Bureau of Education of Lianjiang City

15. Panel discussion and questionnaire survey at Lianjiang Liangdong Middle School

16. Location and surrounding sensitive points of the project for Chunlei Primary School in Lianjiang City

17. sensitive point of Yingzai Middle school at Lianjiang city- Yingzai hospital

18. sensitive point of Changshan centre primary school at Lianjiang city- Yingzai hospital

19. Announcement put up at Lianjiang Liangdong Middle School

20. Sewage outfall of Liangdong Township in Lianjiang City

21. Site investigation at Luoding Chinese High School

22. Questionnaire survey of public participation at Luoding Chinese High School

23. sensitive point of Luoping centre primary school - Zhuwei village

24. sensitive point of Taiping midle school at Luoding city- Yuying kindergarten

25. Panel discussion at Bureau of Education of Suixi County

26. Panel discussion and questionnaire survey of public participation at Suixi Leilin Middle School

27. sensitive point of Zhuyetang primary school at Chengyue town Suixi county- Leilin kindergarten

28. sensitive point of Shagu centre primary school at Yangqing town Suixi county- Qicheng Chinese and English kindergarten

29. Panel discussion at Bureau of Education of Wuchuan City

30. Panel discussion and questionnaire survey of public participation at Wuchuan Huangpo Primary School

31. Proposed location of project for Wuchuan Huangpo Primary School and surrounding sensitive points

32. sensitive point of Wangcungang centre primary school at Wuchuang city- Wangcungang Middle school

33. Site of Jiexi No.4 Huaqiao Middle school

34. sensitive point of No.4 Huaqiao Middle school at Jiexi county- Huazhai village

35. Panel discussion at Bureau of Education of Puning City

36. Panel discussion at Puning Yuxiu Middle School

37. Questionnaire survey at Puning Yuxiu Middle School

38. Questionnaire survey at Puning Yuxiu Middle School

Fig. 9-1 Scene photos of public survey

9.3.2 Summary of Public Survey on SIP

The social evaluation team has carried out a series of project propaganda activities and multiple activities regarding primary stakeholders' participation in project decision making in the areas under the influence of the project, and determined the specific content and goal of the free prior informed consultation of the primary stakeholders on the basis of spot survey. The process of various stakeholders' participation in the project was carried out at three levels, which are as shown in Table 9-2:

Table 9-2 List of the Forms of Participation by Influenced Groups and the Activity Goals

Participant	Participation form	Activity goal
Various government departments	Forum Interview Fill in opinion collection form	(1) Get informed of the current state of project implementation and the appraisal; (2) Get informed of the construction basis, management system, operation mode and post-maintenance of various programs; (3) Raise possible problems and difficulties that might appear during project implementation; (4) Conduct social risk survey on the project within departments and discuss on countermeasures for risk reduction; (5) Collect suggestions on the way to improve project effect; (6) Get informed of the influence imposed by project implementation; (7) Collect relevant literature and statistic data on annual statements, etc. in the provinces, counties (cities/districts) as well as the schools covered by the project.
Principals and representatives of teachers in the schools covered by the project	Forum Interview Ranking Fill in opinion collection form	(1) Degree of understanding about the project The social evaluation team should carry out propaganda among relevant groups and make introduction to every program; (2) Collect data on the necessity of the construction of every program; (3) Get informed of the basic information on the schools and teachers (including teacher structure, major & course setup, housing conditions of teachers, and authorized deployment of teachers, etc.); (4) Get informed of the skills and training of professional managerial personnel in the project; (5) Previous implementing experience of similar projects; (6) Possible problems and difficulties in the construction of every program; (7) Means and measures guaranteeing smooth progress of the project; (8) Demand and expectation for the project
Forum of representatives of students in the schools covered by the	Forum Interview Ranking Fill in opinion collection form	(1) Degree of understanding about and propaganda of the project; (2) Understanding of educational input and poverty of the families; (3) Ranking of possible problems in school education;

project and their parents		(4) Ranking of possible improvements in school education; (5) Carry out individual interview with special groups (leftover children, disabled students and girls) to get informed of their education

9.3.3 Results statistics and analysis of public involvement

In order to know the ideas and suggestions on project construction and environment protection from people influenced by the project, we issue questionnaires to people in the project area, including county (city/district) project management officers, school administrators, teachers, students, parents, surrounding villagers and other stakeholders. Aiming at features of civil engineering (standardized classrooms and dormitories for teachers in remote rural areas) and standard mobile laboratories, appropriate questionnaires are designed (see annex 5-7).

9.3.3.1 Result analysis of questionnaires on civil engineering

16,500 questionnaires were issued and 16,354 were returned, and the returning rate is 99.1% with 16,221 effective questionnaires. Basic information of respondents is shown in table 9-3 and questionnaire results are shown in table 9-4. Data from basic information table of respondents of questionnaires on civil engineering show that females account for 33.7%, people aged from 41~60 account for 36.9% while people with junior college and above account for 34.5%, which represents the basic features of people in civil engineering (standardized classrooms, dormitories for teachers in remove rural areas). Questionnaires filled in by people who can reflect the true conditions and feelings of the public. See table 9-4 for the statistics and relevant analysis of various questions on the questionnaire.

Table 9-3 Basic information table of respondents of questionnaires on civil engineering

	Gender		Age				Educational background			
	Male	Female	Under 18	18~40	41~60	Over 60	Junior college and above	High school	Middle school	Primary school
Number (person)	10,280	5,941	4,361	5,391	5,998	470	5,612	2,233	5,168	3,209
Proportion (%)	63.3%	33.7%	26.8%	33.2%	36.9%	2.8%	34.5%	13.7%	31.8%	19.7%

Table 9-4 Statistical result and analysis table of the questionnaire on civil engineering

No.	Investigation content	Options	Number of people	Proportion %	Analysis and results
1	Do you know the project?	Yes	12,212	75.2	2.9% don't know about the project, which means that the project needs stronger publicity.
		A little	3,531	21.7	
		Not at all	478	2.9	
2	How do you know about the project?	Notice board	8,833	54.4	People know about the project from notice board account for 54.4%, indicating that the project announcement is effective.
		TV/Newspaper/Internet/Forum	4,839	29.8	
		Local residents	1,558	9.6	
		Others	991	6.1	
3	What do you think of the project?	Approve	15,967	98.4	0.6% disapproves the project while 98.4% approves the project construction.
		Disapprove	113	0.6	
		No comment	141	0.8	
4	What do you think of the project location?	Reasonable	15,913	98.1	0.04% holds that the project location is unreasonable while 98.1% holds that it is reasonable.
		Unreasonable	66	0.04	
		No comment	242	0.14	
5	What impact will the project bring	Improvement	14,825	91.3	0.1% holds that the project construction will hinder the

No.	Investigation content	Options	Number of people	Proportion %	Analysis and results
	on local economy?	Inhibition	166	0.1	development of local economy while 91.3% holds that it will improve the local economy.
		No impact	1,004	0.61	
		No comment	226	1.3	
6	Are you satisfied with the local environmental quality?	Yes, very satisfied	12,227	75.3	About half respondents hold that the project will have a great influence on water environment.
		Just so so	3,619	22.3	
		No	284	1.7	
		No comment	91	0.5	
7	What's the major local environment problem?	Water pollution	3,046	18.7	61.4% holds that the major environmental problem is household garbage
		Atmospheric pollution	1,299	8	
		Noise	1,531	9.4	
		Ecological damage	371	2.2	
		Household garbage	9,974	61.4	
8	What's the major environmental problem of standardized mobile laboratory?	Water pollution	2,083	12.8	58.2% holds that household garbage is the major environmental problem of newly built schools/dormitories for teachers.
		Atmospheric pollution	946	5.8	
		Noise	3,356	20.6	
		Ecological damage	390	2.4	
		Household garbage	9,446	58.2	
9	Which period of the project will environment problems appear?	Pre-construction period	3,079	18.9	53.3% holds that environmental problems may appear in the construction period.
		Construction period	8,655	53.3	
		Trail operation period	1,861	1.1	
		Operation period	2,626	16.1	
10	What will the project influence most on local	Water environment	5,899	36.3	36.3% holds that the project will influence the water environment most after

No.	Investigation content	Options	Number of people	Proportion %	Analysis and results
	environment after completion?	Atmospheric environment	1,319	8.1	completion. The project will have certain influence on water environment, but the influence is slight due to the short construction period.
		Ecological environment	4,651	28.6	
		Noisy environment	4,352	26.8	
11	What major environmental benefits does the project have?	Reduce pollution	3,268	20.1	20.1% holds that the project can reduce pollution while 72.6% holds that the project will improve the quality, indicating that most people think the project will bring in environmental benefits.
		Reduce energy consumption	1,164	7.1	
		Improve quality	1,1789	72.6	
12	What will the project influence your benefits after completion?	Income improvement	1,745	10.7	47% holds that the project will improve the environment while 36.4% holds that it can increase their knowledge, indicating the necessity of the project.
		Environment improvement	7,629	47	
		Employment increase	941	5.8	
		Knowledge increase	5,906	36.4	
13	In order to ensure the successful implementation of the project, what should be strengthened?	Publicity and education	6,807	41.9	41.9% holds that publicity and education should be strengthened while 22.66% holds that monitoring during the construction period should be strengthened, which is also the key in project preparation period.
		Training	817	5	
		Organization and implementation of monitoring and evaluation	1,795	11	

No.	Investigation content	Options	Number of people	Proportion %	Analysis and results
		Monitoring during the construction period	52	5.53	
14	What suggestions do you have on project construction and environmental protection?	Major suggestions: Prevention measures should be taken into account during the construction period. Students are not allowed to enter in the construction plant. Try best to reduce the influence on schools, especially noise and solid waste. During the construction period, in order to minimize the pollution sewage discharge should be paid great attention to.			
15	What difficulties and expectations do you have on the project implementation and construction?	Basic education should be valued. Set several classified garbage cans to conduct garbage classification. Improve the working environment of teachers. Improve the teaching quality. Make project publicity and trainings.			

9.3.3.2 Result analysis of questionnaires on standardized mobile laboratory

940 questionnaires were issued and 940 were returned, and the returning rate is 100% with 940 effective questionnaires. Basic information of respondents is shown in table 9-5 and questionnaire results are shown in table 9-6. Data from basic information table of respondents of questionnaires on standardized mobile laboratory show that females account for 31.91%, people aged from 41~60 account for 44.79% while people with junior college and above account for 46.81%, which represents the basic features of people in standard mobile laboratories. Questionnaires filled in by such people can reflect the true conditions and feelings of the public. See table 9-6 for the statistics and detailed analysis of various questions on the questionnaire.

Table 9-5 Basic information table of respondents of questionnaires on standardized mobile laboratory

	Gender		Age				Educational background			
	Male	Female	Under 18	18~40	41~60	Over 60	Junior college and above	High school	Middle school	Primary school
Number (person)	640	300	191	307	421	21	440	93	296	111
Proportion (%)	68.09	31.91	20.32	32.66	44.79	2.23	46.81	9.89	31.49	11.81

Table 9-6 Statistical result and analysis table of the questionnaire on standardized mobile laboratory

No.	Investigation content	Options	Number of respondents	Proportion %	Analysis and results
1	Do you know the project?	Yes	534	56.81	14.04% don't know about the project, which means that the project needs stronger publicity.
		A little	269	28.62	
		Not at all	132	14.04	
2	How do you know about the project?	Notice board	391	41.60	People know about the project from notice board account for 41.6%, indicating that the project announcement is effective.
		TV/Newspaper/Internet/Forum	382	40.64	
		Local residents	76	8.09	
		Others	81	8.62	
3	What do you think of the project?	Approve	847	90.11	1.17% disapproves the project while 90.11% approves the project construction.
		Disapprove	11	1.17	
		No comment	82	8.72	
4	What do you think of the project location?	Reasonable	772	82.13	3.83% holds that the project location is unreasonable while 82.13% holds that it is reasonable.
		Unreasonable	36	3.83	
		No comment	132	14.04	
5	What impact will the project bring on local economy?	Improvement	761	80.96	1.17% holds that the project construction will hinder the development of local economy while 80.96% holds that it will improve the local economy.
		Inhibition	11	1.17	
		No impact	105	11.17	
		No comment	63	6.70	
6	Are you satisfied with the local	Yes, very satisfied	465	49.47	About half respondents are very satisfied with the local
		Just so so	306	32.55	

No.	Investigation content	Options	Number of respondents	Proportion %	Analysis and results
	environmental quality?	No	155	16.49	environment quality.
		No comment	12	1.28	
7	What's the major local environment problem?	Water pollution	247	26.28	50.43% holds that the major environmental problem is household garbage
		Atmospheric pollution	103	10.96	
		Noise	56	5.96	
		Ecological damage	52	5.53	
		Household garbage	474	50.43	
8	What's the major environmental problem of standardized mobile laboratory?	Water pollution	384	40.85	40.85% holds that water pollution is the major environmental problem of standardized mobile laboratory.
		Atmospheric pollution	153	16.28	
		Noise	225	23.94	
		Ecological damage	89	9.47	
		Household garbage	82	8.72	
9	Which period of the project will environment problems appear?	Pre-construction period	159	16.91	40.74% holds that environmental problems may appear in the construction period. However the project is to purchase services, thus there is no pollution in the construction period.
		Construction period	383	40.74	
		Trail operation period	236	25.11	
		Operation period	155	16.49	
10	What will the project influence most on local environment after completion?	Water environment	436	46.38	46.38% holds that the project will influence the water environment most after completion.
		Atmospheric environment	161	17.13	
		Ecological environment	188	20.00	
		Noisy environment	155	16.49	
11	What major environmental benefits does the project have?	reduce pollution	436	46.38	46.38% holds that the project can reduce pollution while 35.23% holds that the project will improve the quality, indicating that most people think the project will bring in environmental benefits.
		Reduce energy consumption	161	17.13	
		Improve quality	334	35.53	
12	What will the project influence your benefits after completion?	Income improvement	135	14.36	46.96% holds that the project will improve the environment while 40.32% holds that it can increase their knowledge, indicating the necessity of
		Environment improvement	385	40.96	
		Employment increase	35	3.72	

No.	Investigation content	Options	Number of respondents	Proportion %	Analysis and results
		Knowledge increase	379	40.32	the project.
13	In order to ensure the successful implementation of the project, what should be strengthened?	Publicity and education	620	65.96	65.96% holds that publicity and education should be strengthened while 22.66% holds that training should be strengthened, which is also the key in project preparation period.
		Training	213	22.66	
		Organization and implementation of monitoring and evaluation	49	5.21	
		Monitoring during the construction period	52	5.53	
14	What suggestions do you have on project construction and environmental protection?	Major suggestions: they hope to implement the project as soon as possible with quality and quantity guarantee. In addition, they hope the project will protect the environment. Don't influence the daily life of local residents during the construction period.			
15	What difficulties and expectations do you have on the project implementation and construction?	Reduce the impact on the surrounding environment, reasonable treatment of experimental waste and waste water.			

9.4 Information Disclosure and Feedback

9.4.1 On-site Announcement

On-site announcement is performed during the first public participation (December 23, 2015 - January 6, 2016) and the second public participation (February 19, 2016 - Match 4, 2016) by attaching paper announcement to announcement boards of project-associated bureaus of education in townships, schools and village committees, as well as other densely populated areas as shown in the pictures below:

Table 9-7 the first and the second public participation

No.	content	Location	Pictures
1	First on-site announcement	Bureau of Education of Wengyuan County	
		Neihu Middle School in Lufeng County	
		Bureau of Education of Huilai County	
		Wuchuan Huangpo Primary School	
		Xihe Neighborhood Committee	

No.	content	Location	Pictures
		Huazhai Village of Jiexi County	
		Chenlin Middle School of Chaoyang District	
		Xilou Village, zhanlong town, Puning City	
2	Secord on-site announcement	Tongqing Middle School of Huazhou City	
		Jishui Townof Lianjiang City	

No.	content	Location	Pictures
		Xihe Neighborhood Committee of Wuhua County	
		No.4 Huaqiao Middle School of Jiexi County	
		Dianpu Primary School, Xian'an Town, Huilai County	
		Qiaozhu Middle School of Puning City	

No.	content	Location	Pictures
		Xingang Village, Gangmen Town, Suixi County	
		TianchongVillage of Dianbai District	
		Bazai Central Primary School of Wengyuan County	
		Yangjia Village, Yangjia Town, Leizhou City	

No.	content	Location	Pictures
		Huangqiang Village, Huangqiang Town, Haifeng County	
		Bureau of Educaiton of Chaoyang District	
		Bureau of Education of Chao'an District	

9.4.2 Online Announcement

I. The first public announcement

The first announcement was carried out at the websites of Department of Education of Guangdong Province, Pearl River Water Resources Protection Bureau and the 16 county-level (city/district-level) bureaus of education during period December 23, 2015 - January 6, 2016; the websites are shown in the table below:

Table 9-8 Websites for the first online announcement

No.	Designation	Website	Pictures
1	Department of Education of Guangdong Province	http://www.gdedu.gov.cn/business/htmlfiles/gdjyt/tzgg/201512/494724.html	
2	Pearl River Water Resources Protection Bureau	http://www.zwsw.gov.cn/jndt/39548.shtml	
3	Bureau of Education of Huazhou City	http://gov.hze.gov.cn/2015/1224/39015.shtml	
4	Bureau of Education of Wuhua County	http://www.whedu.org.cn//ggl/2015-12-24/1450921228d78354.html	

No.	Designation	Website	Pictures
5	Bureau of Education of Lufeng County	http://www.lf-edu.cn/index.php?a=shows&catid=35&id=340	
6	Bureau of Education of Chaoyang District	http://www.cyjyxxw.com/Item/2776.aspx	
7	Bureau of Education of Puning City	http://www.pnjyj.gov.cn/a/ztlm/yiwujiaoyujunhengfazhan/2015/1223/9518.html	
8	Bureau of Education of Suixi County	http://www.zhanjiang.gov.cn/fileserver/newshtml/318a8e0c-6488-4f08-b692-3584acff2e81.htm	

No.	Designation	Website	Pictures
9	Bureau of Education of Luoding City	http://ld.edugd.cn/Article/ShowInfo.asp?InfoID=14513	
10	Bureau of Education of Dianbai District	http://www.dbedu.cn/news/?406.html	
11	Bureau of Education of Lianjiang City	http://ljjy.zhjedu.cn/news_show.asp?id=935	
12	Bureau of Education of Wengyuan County	http://www.gdwykj.com/GD_ReadNews.asp?NewsID=8568	

No.	Designation	Website	Pictures
13	Bureau of Education of Wuchuan City	http://wcjy.30edu.com/Article/6d015945-7d9b-418b-8253-7f11a5f292c4.shtml	
14	Bureau of Education of Jiexi County	http://zwgk.jiexi.gov.cn/xxgk/OpenInfoView.action?theID=1314	
15	Bureau of Education of Haifeng County	http://www.gdhf.gov.cn/html/7/33548.htm	
16	Bureau of Education of Chao'an District	http://www.cajyw.com/index.aspx?lanmuid=73&sublanmuid=632&id=645	

No.	Designation	Website	Pictures
17	Bureau of Education of Huilai County	http://gdhledu.com/newview.aspx?id=680	
18	Bureau of Education of Leizhou City	http://lzjy.30edu.com/article/8882158d-0c9e-4472-9599-8730f1e3fe5c.shtml	

The content of announcement is as follows:

1. Profile of construction project;

2. Working procedures and primary coverage of evaluation;

3. Range of advice-taking and principal matters;

4. Seek public opinions;

5. Method and time limit for the public to consult simplified edition of environmental impact statement;

6. Starting and ending dates of the period for the public to offer comments: December 23, 2015 - January 6, 2016;

7. Contact information, including the mailing address, postal code, telephone number, fax number, contact person and E-mail address, etc. of developer and environmental impact assessment body.

Ⅱ. The Second Announcement

After the first draft for project is finished and approved by the WB Safeguard Delegation and modified based on its comments, the second announcement is performed at websites of Department of Education of Guangdong Province etc. during period from February 19 to March 4, 2016.The primary coverage of the second announcement is as follows:

1) Simplified edition of environmental management plan (Chinese);

2) Starting and ending dates of the period for the public to offer comments: From February 19 to March 4, 2016;

3)Contact information, including the mailing address, postal code, telephone number, fax number, contact person and E-mail address, etc. of developer and environmental impact assessment body.

Refer to Table 9-9 below for websites of information disclosure:

Table 9-9 Websites for the second online announcement

No.	Designation	Website	Pictures
1	Department of Education of Guangdong Province	http://www.gdhed.edu.cn/business/htmlfiles/gdjyt/tzgg/201602/495737.html	
2	Pearl River Water Resources Protection Bureau	http://www.zwsw.gov.cn/ggtz/40456.shtml	

No.	Designation	Website	Pictures
3	Bureau of Education of Huzhou City	http://gov.hze.gov.cn/2016/0222/39027.shtml	
4	Bureau of Education of Wuhua County	http://www.whedu.org.cn//ggl/1970-01-01/0d80330.html	
5	Bureau of Education of Lufeng County	http://www.lf-edu.cn/index.php?a=shows&catid=35&id=379	
6	Bureau of Education of Chaoyang District	http://www.cyjyxxw.com/Item/2840.aspx	

No.	Designation	Website	Pictures
7	Bureau of Education of Puning City	http://www.pnjyj.gov.cn/a/ztlm/yiwujiaoyujunhengfazhan/2016/0223/10278.html	
8	Bureau of Education of Suixi County	http://www.zhanjiang.gov.cn/fileserver/statichtml/2016-02/60aa3e02-e958-48c3-bc60-3239aafaab23.htm	
9	Bureau of Education of Luoding City	http://ld.edugd.cn/Article/ShowInfo.asp?InfoID=14740	
10	Bureau of Education of Dianbai District	http://www.dbedu.cn/news/?431.html	
11	Bureau of Education of Lianjiang City	http://www.ljedu.cn/news_show.asp?id=954	

No.	Designation	Website	Pictures
12	Bureau of Education of Wengyuan County	http://www.gdwykj.com/GD_ReadNews.asp?NewsID=8631	
13	Bureau of Education of Wuchuan City	http://wcjy.30edu.com.cn/article/fc016c1f-115d-4691-8f25-08e1cf8faa97.shtml	
14	Bureau of Education of Jiexi County	http://zwgk.jiexi.gov.cn/xxgk/OpenInfoView.action?theID=1931	
15	Bureau of Education of Haifeng County	http://www.gdhf.gov.cn/html/7/33886.htm	
16	Bureau of Education of Chao'an District	http://www.cajyw.com/index.aspx?lanmuid=73&sublanmuid=632&id=664	

No.	Designation	Website	Pictures
17	Bureau of Education of Huilai County	http://gdhledu.com/newview.aspx?id=681	
18	Bureau of Education of Leizhou City	http://lzjy.30edu.com.cn/article/97289c96-4e60-4a53-b7e0-f4ee3d0371b6.shtml	

Ⅲ、**Full text announcement**

The full text of the project construction implementation needs to be publicized in accordance with relevant regulations of Public Participation Method of Environmental Protection (Ministry of Environmental Protection Decree No. 35) , Notice on Further Enhancing Information Publication of Environmental Protection (HB [2012] No. 134) and Government Information Publication Guide to Construction Project Impact to Environment (Trial) (General Office of Ministry of Environmental Protection HB [2013] No. 103) which were implemented on September 1, 2015. Refer to the website in the table below.

Table 9-10 Websites and newspaper for the full text announcement

No.	Designation	Website/Page	Pictures
1	Department of Education of Guangdong Province	http://www.gdedu.gov.cn/publicfiles//business/htmlfiles/gdjyt/tzgg/201604/497740.html	
2	Nan Fang Daily	A11 Edition April 29, 2016	 

9.4.3 Summary of Public Participation Comments and Feedback

Table 9-11 Summary sheet of comments and feedback from public participation

Type	Public opinion	Feedback corresponding to environmental management plan
Comments for the construction period	1. Control construction dust	① Make necessary ground hardening and watering for dust suppression ② The granular materials with fine particle should be kept tightly, ③ The remaining dusty materials after removal of composting should be timely cleaned. ④ Vehicles should slow down when entering the construction site.
	2. Control construction noise	① Shock absorption foundation should be prepared for mechanical equipments with big noise; ② It is necessary to select the low-noise equipment and control the construction time ③ The equipment with operation noise should be placed indoor ④ Make regularly maintenance of construction equipment ⑤ Construction and transportation vehicles are required to slow down and forbidden to toot near the construction site.
	3. Control construction wastewater	① It is necessary to construct sedimentation pool for precipitating the industrial wastewater; the wastewater after sedimentation may be used for dust suppression ② Pipeline sealing should be guaranteed when laying drip irrigation pipe network. ③ Vehicles should be maintained in the professional maintenance point ④ Mechanical equipment before using should be inspected for oil or water leakage.
	4. Control construction garbage	① Wastes should be sorted for further treatment ② Recyclable or renewable materials should be sorted for recycling. ③ Unrecyclable wastes should be timely cleaned by the entrusted garbage collection unit; ④ All solid wastes produced during construction shall be completely removed upon the completion of engineering project.
	5. Construction safety	① Publicity about the engineering construction information

Type	Public opinion	Feedback corresponding to environmental management plan
	control	should be posted at the site and surrounding areas. ② The constructors working in the dusty site should wear respirator. ③ Personnel engaged in drilling or electric welding shall be equipped with earplug and arc protection goggles. ④ For painting and chemical solvent, it is necessary to select the eco-friendly and non-toxic materials.

9.5 Summary of public involvement

In order to obtain public suggestions, means of forums, visits, questionnaires, on-site announcements, internet announcements are adopted successively. Through such means, people in the project area are basically informed of the project. They all approve the construction of the project. They hold that the project construction is beneficial to local economic and social development and it can improve the environment quality of surroundings. They hope the project will be implemented as soon as possible with quality and quantity guarantee. In addition, in order to give play to its social, environmental and economic benefit, environment protection should be paid attention to.

Chapter X Conclusion

10.1 Project Development Content

The World Bank Loan Guangdong Compulsory Education Project comprises 8 projects and 22 sub-projects. The 22 items which can be divided into the "hardware items" mainly engaged in capital construction and equipment procurement and the "software items" which is aiming at promoting the compulsory education connotation development in accordance with the project natures. Among the 22 subprojects, the 5 "hardware items" mainly include the "Ban Ban Tong (BAN BAN TONG (BBT))" teaching platform and maintenance of quality education resources, online classroom teaching stations and its maintenance, standardized classrooms, standardized mobile laboratories and Teacher turnover dormitories in the remote rural areas, and the remaining 17 ones are the "software items". Environmental management plan of this project includes standardized classrooms, standard mobile laboratories, and teacher temporary dormitories in poor remote rural areas.

Each standard classroom is designed with a building area of 100m^2, and the construction items include civil work, decoration and installation works (water supply & drainage, electric power, ventilation, and light current etc.). This project comprises a total of 250 standardized classrooms in 16 counties (cities/districts).

Standard mobile laboratories involve 3 counties (cities/district) in Guangdong Province, i.e. Lufeng City, Chaoyang District and Dianbai District. Standard mobile laboratories are carried by buses, which are 12m in length, 2.55m in width, 3.95m in height and 6.05m in wheel base and furnished with passenger seats. The facilities include test stand, floor, water supply system, power supply system, air-conditioning system, ventilation system, early warning & escape system, video monitoring system and wastewater recycling system.

Each teacher temporary dormitory in poor remote rural areas is designed with a building area of 35 square meters and furnished with bathroom and kitchen; the construction items include civil works and basic decoration works. The 16 counties (cities/district) are provided with a total of 5200 said dormitories.

10.2 Conclusion of Environment Analysis for Project

I. Civil Work (for standardized classrooms and teacher temporary dormitories in poor remote rural areas)

According to the identification of construction project items, the primary impact of teacher temporary dormitories in poor remote rural areas on environment results from civil work, and principally comprises the environmental impacts of construction period, including:

1. Atmospheric environment: The dust resulting from vehicles travel and stockpiling of construction materials and earth during construction, the dust produced during mixing of concrete and mortar, the dust resulting from the transport of earth, residue soil and construction wastes, and the exhaust emissions of construction machinery and vehicles; Offensive smell from public toilets during operation period.

2. Aquatic environment: Construction wastewater, the domestic sewage from construction personnel, foundation pit excavation-induced seepage water and the wastewater containing mechanical oil bring about water pollution. Domestic wastewater produced during operation period.

3. Acoustic environment: The noise produced by construction machinery and transport vehicles during construction period, as well as the operation of mechanical equipment, bulldozer, excavator and water pump etc. affects acoustic environment around project area.

4. Solid wastes: The solid wastes in construction period include construction wastes (including steel products, construction site enclosure, packaging material, fuel storage tank, lubricant and paint, etc.), waste oils, household garbage, and the wastes from

wastewater disposal facility (e.g. sedimentation basin). Household garbage in operation period.

5. Ecological environment: Site clearing and vegetation removal may lead to the losses of habitat and vegetation; earthwork movement may cause disturbance to soil; the failure to cover stockpiles and excavation points under adverse weather conditions may bring about water loss and soil erosion.

II. Standard Mobile Laboratories

According to the identification of construction project items, the primary impact of standard mobile laboratories on environment results from vehicle travel, and principally comprises the environmental impact of operation period, including:

1、 Atmospheric environment: Vehicle travel-induced dust and exhaust pollution

2、 Aquatic environment: Test wastewater produced in laboratory

3、 Solid wastes: Test wastes produced in laboratories

Carry out circuit experiment teaching activities in rural schools through standard mobile laboratories to resolve such problems as the reduction of rural schools in scale, insufficient teaching instrument and equipment, the lack of experiment teachers, and the few opportunities for students to perform experiment, so as to improve experiment teaching in rural schools and promote education for all-round development.

10.3 Conclusion of Environmental Impact Mitigating Measures

I. Civil Work (for standardized classrooms and teacher temporary dormitories in poor remote rural areas)

The following controlling and mitigating measures are proposed against the adverse impact of standard classroom and teacher temporary dormitories in poor remote rural areas on atmospheric environment, aquatic environment, acoustic environment and solid wastes:

1. Perform necessary ground hardening, and control dust through watering; fine-particle loose materials shall be stored in an enclosed manner; shielding measures shall be taken for loading & unloading and handling operations; residual dust material must be cleared in a timely manner upon the removal of stockpile; reinforce transport vehicle management: The vehicle approaching construction site shall slow down so as to minimize fugitive dust; the loading space of vehicles for transporting earth, residue soil and construction wastes shall be enclosed.

2. Construction site shall be furnished with sedimentation basin for sedimentation of production-induced wastewater, and the precipitated wastewater could be used for construction site or dust laying; construction site shall be provided with no machinery and vehicle maintenance stations or cleaning stations, and maintenance shall be performed at specialized maintenance stations so as to avoid oily wastewater on construction site; mechanical equipment must be checked for oil or water leakage before use.

3. Noisy mechanical Equipment must be equipped with foundation damping mechanism or damping bearing or wrapped with damping material; it's advisable to use low-noise equipment, exercise strict control over construction time, and put noisy operating equipment in rooms. Make reasonable arrangement of construction period to avoid the operation of several sets of large high-noise machinery on the same construction site during the same period of time; the contractor shall perform regular maintenance of construction equipment, and assure the optimum operating condition and minimum noise level to whatever extent possible; on-site idle facilities must be in a shut-down or throttling & damping state; transport vehicles shall slow down and observe horn-blowing control rules near construction site.

4. Subject construction, dismantling and site clearing-induced wastes to classified treatment, perform classified collection & recycling of immediately recyclable or renewable materials, and entrust clearing & transport service providers with environmental services qualification certificate approved by related authorities to remove the other materials in a timely manner; in case of oil spill during construction, the contaminated soil must be cleared immediately; remove the obstruction from drain

ditch on a regular basis; all solid wastes produced during construction must be removed upon the completion of project.

Refer to Annex 1 (civil work ECOP) for further information about mitigation measures.

II. Standard Mobile Laboratories

The following controlling and mitigating measures are proposed against the effect of standard mobile laboratories on atmospheric environment, aquatic environment and solid wastes etc.:

1. Smooth riding surfaces shall be selected based on properly determined vehicle routes so as to minimize dust emission.
2. Liquid wastes from lab shall be delivered to wastewater treatment plant which need to have the ability for final treatment;
3. The reagents accidentally damaged during experiment shall be treated in a timely manner to prevent secondary pollution;
4. Make an inventory of test articles after each experiment to avoid omission;
5. The experiment garbage produced during test shall be disposed of by qualified organizations. See Annex 2 (standard mobile laboratories ECOP) for details of mitigation measures.

10.4 Conclusion of Environmental Monitoring Plan

Environmental monitoring of WWTPs shall be performed during operation period so as to assure environmental protection in project implementation area, verify the result of environmental impact prediction & assessment, prevent adverse effect of sudden accident on the environment, and develop detailed environmental protection measures implementation plan. Environmental monitoring could provide scientific basis for environmental pollution control, environmental management and regional environmental protection in operation periods of project.

10.5 Conclusion of Public Participation

All stakeholders in the 16 counties (cities/districts) know the profile of this project and support the project implementation, believing the project development is beneficial to local economic development and could improve ambient environment quality, hoping that the project could be carried into practice with quality, quantity and environmental protection assured so that it could bring about social, environmental and economic benefits as soon as possible.

10.6 Conclusion of Overall Evaluation

According to the result of environmental management plan implementation for this project, the development of this project is in conformity with relevant national and local policy planning, and helps to stimulate local economic and social development. The environmental impact of construction period and operation period for civil work and the operation period of standard mobile laboratories is acceptable after the implementation of rational measures. This construction project is considered feasible in respect of environmental protection provided the developer could strictly practice the "three simultaneous'" system for environmental protection, and implement all environmental protection measures proposed in this environmental management plan.

Appendix 1

THE WORLD BANK
Working for a World Free of Poverty

World Bank Loan Guangdong Compulsory Education Project

Civil Work
Environmental Codes of Practice

Department of Education of Guangdong Province

Scientific Institute of Pearl River Water Resources Protection

June 2016

Civil Work ECOP

The ECOP is developed to assure the successful project implementation and guarantee the failure-free operation of civil works (standard classroom and teacher temporary dormitories in poor remote rural areas); each standard classroom is designed with a building area of 100m^2, and the construction comprises civil works, decoration works and installation works (water supply & drainage, electric power, ventilation, and light current etc.) of classroom. This project comprises a total of 250 standardized classrooms in 16 counties (cities/districts). Each teacher temporary dormitory in poor remote rural areas is designed with a building area of 35 square meters and furnished with bathroom and kitchen; the construction items include civil works and basic decoration works. The 16 counties (cities/district) are provided with a total of 5200 said dormitories.

Civil work ECOP comprises 3 segments: ① Environmental protection measures for engineering design; ② environmental protection measures for construction period; ③ Environmental protection measures for operation period.

I. Engineering design EP measure

1. Contractors are required to establish the supervising and liability system for the implementation of EP measures in the construction period, responsible for the implementation so as to ensure construction activities compliant with requirements of EP and all necessary measures have been taken during construction.

2. The construction unit and PS shall, prior to construction, receive training relating to EP and environmental management. The project management office at provincial level is required to entrust outside experts providing training for contractors and PS so as to allow them confirm project-related EP requirements.

3. The contractor shall, based on the annual budget, reserve deposits for the completion of environmental management accounting approximately for 3% of budget in the project contract fund. When the construction unit fails to take effective EP measures, the administrator in charge of EP shall put forward rectification opinions, in case EP measures are still not effectively implemented after rectification, the project

management office at provincial level will, in accordance with the contract, impose fines on the construction unit, detain the project payment as the fines for failure in EP and entrust others to take related measures.

II. EP measures during construction period

(I) Dust pollution control

Primary source of construction dust: dust from driving vehicles on roads on construction site, from piled building decoration materials and earthworks, from earthwork, muck and construction garbage in transit and from mortar mixing.

For above sources of dust pollution, following dust pollution control measures are provided by the code:

1. Road hardening has been completed on the construction site, while the dusty road section should be regularly watered for dust suppression.

2. The material storage area, machining area and large template storage place in the construction site should be flat and solid. Materials should be piled up in compactness to reduce land occupation.

3. The granular materials with fine particle should be kept tightly, and shelters should be equipped during loading and transporting. The remaining dusty materials after removal of composting should be timely cleaned.

4. The exposed area in the construction site should be properly watered for dust suppression.

5. Strengthen the management of transport vehicle. Vehicles entering the construction site should slow down to reduce dust. In addition, the loading space for the vehicles transporting earthworks, mucks and construction wastes should be properly sealed.

(II) Water pollution control

Construction wastewater and domestic sewage from construction personnel constitutes the main part of wastewater during construction of civil work; construction wastewater includes mortar mixing-induced wastewater and cleaning water; this procedure proposes

the following discharge control measures against the said wastewater:

1. Precipitated mortar mixing-induced wastewater could be used for dust suppression. 2. Drainage channels shall be desilted on a regular basis.

3. The domestic sewage from construction personnel and the equipment cleaning-induced wastewater is treated at original sewage treatment facility of the school (discharged into municipal piping network (if any) or treated with original three-stage septic tank where no municipal piping network is available).

(III) Noise pollution control

Noise pollution during the construction period mainly comes from the construction machinery and transport vehicles. Based on the features of noise pollution of public supportive engineering, following control measures are provided by the code:

1. Related noise regulation shall be complied with during construction period.

2. Construction time should be strictly kept within 8: 00～20: 00, during lunch break (12:00～14:00) among which, construction shall be ceased. The access time for construction vehicles shall be compliant with requirements of local government.

3. Residents leaving nearby should be informed of continuous construction at night. In addition, it is necessary to complete relevant formalities and take measures to mitigate the impact on surrounding residents. Within the noise limit period, construction unit shall receive the effective CNP.

4. Night construction, if necessary, should be performed within the specified period after getting approval from the competent department. No unauthorized operation of noisy mechanical equipment is allowed.

5. The equipment with noise shall be operated in a closed room.

6. To reduce impact on surrounding environment during construction, is required to use low-noise equipment and close windows and doors as much as possible

7. By performing regular maintenance, the contractor is required to keep the construction equipment under the optimum working condition and lowest level of noise as much as possible.

8. Facilities left used have to be shut down or controlled under energy-saving and vibration reduction state.

9. Construction and transportation vehicles are required to slow down and forbidden to toot near the construction site.

(IV) Waste control

Solid wastes produced during construction period mainly include the construction garbage, dumped oil, chemical solvents and household garbage, among which, the construction garbage is the major solid wastes, mainly containing soil, muck, scattering mortar and concrete, masonry and broken concrete, and the wastes from decoration, sorts of packing materials and other wastes. For those solid wastes from project construction, following waste control measures are provided by the code:

1. Construction and domestic wastes should be separately collected, stored and timely removed as per regulations.

2. Construction wastes should be cleaned daily and forbidden to throw from high.

3. Wastes from construction, demolition and site cleaning should be sorted for further treatment, among which, recyclable or renewable materials should be sorted for recycling, with remaining wastes timely cleaned by the entrusted garbage collection unit. Garbage collection unit shall hold the environmental service certificate issued by relevant department.

4. The dumped oil and chemical solvent should be stored in centralization, treated by the qualified entrusted unit and may not be poured out at will.

5. Construction equipment should be maintained to prevent oil spillage.

6. All solid wastes produced during construction shall be completely removed upon the completion of engineering project.

(V) Construction safety and others

1. Prior to construction, construction unit should handle the temporary access card, and the constructors should access with the card.

2. During engineering construction period, the publicity about engineering construction information should be posted at the construction site and surrounding areas so as to inform the public of specific construction activity and time, contact and contact phone number of construction unit as well as get to know the public complaint and suggestion on the construction activity.

3. The constructors working in the dusty site should wear respirator. Personnel engaged in drilling or electric welding shall be equipped with earplug and arc protection goggles.

4. For painting and chemical solvent, it is necessary to select the eco-friendly and non-toxic materials.

(Ⅵ) Soil and water conservation measures

1、Construction materials should be classified in the vicinity of the construction area or the same as with the theme of the project. We should pay attention to moisture proof issues.

2\、We should promptly use retaining measures and temporary protective measures, and make drainage engineering in a good way during construction period.

3、Layer by layer filling and compaction during site grading. After site formation works, we should adopt temporary protective measures to reduce water erosion.

4、We should use the temporary block and temporary cover measures during earthwork excavation, at the same time, we should do the construction of temporary drainage ditch and temporary grit chamber to protect water and soil resources.

5、We need to strengthen management, reasonable adjustment of the construction process, in order to reduce the loss of water and soil in the construction process.

III. Environmental Protection Measures for Operation Period

It's essential during operation period to place stress on ventilation facility operation management, further perfect the rules and regulations for lab safety management, enhance the environmental awareness of school management personnel and teachers & students, rigorously abide by related disciplines and procedures of the school, reinforce safety education, and prevent fire accident.

Appendix 2

THE WORLD BANK
Working for a World Free of Poverty

World Bank Loan Guangdong Compulsory Education Project

Project of Standard Mobile Laboratories Environmental Codes of Practice

Department of Education of Guangdong Province

Scientific Institute of Pearl River Water Resources Protection

June 2016

ECOP for Project of Standard Mobile Laboratories

Standard mobile laboratories involve 3 counties (cities/district) in Guangdong Province, i.e. Lufeng City, Chaoyang District and Dianbai District. Standard mobile laboratories are carried by buses, which are 12m in length, 2.55m in width, 3.95m in height and 6.05m in wheel base and furnished with passenger seats. The facilities include test stand, floor, water supply system, power supply system, air-conditioning system, ventilation system, early warning & escape system, video monitoring system and wastewater recycling system（Volume is not less than 40L）.

The ECOP for project of standard mobile laboratories principally comprises the following segments: Environmental protection measures during operation period.

I. Analysis on pollution sources

According to experiment textbooks for primary and secondary school students, basic experiments include measurement experiment, exploration experiment and demonstration experiment. Wastewaters generated include effluents with acid, alkali, salt, oxidants and reducing agents, etc. Solid waste includes oxides, permanganate salt and hydrochloride waste.

II. Environmental Protection measures in the operation period

Environmental implementation rules of the standard mobile laboratories are mainly reflected in the following links: environmental measures in the operation period.

I. Atmospheric Environment

1. Smooth riding surfaces shall be selected based on properly determined vehicle routes so as to minimize dust emission.

2. The buses carrying standard mobile laboratories shall be used with national standard-compliant gasoline to minimize automobile exhaust pollution.

II. Aquatic Environment

1. Project management office of each county (city/district) should sign a contract with

wastewater treatment plant. Liquid wastes from lab shall be delivered to the nearest local wastewater treatment plant for final treatment, and the WWTPs shall have adequate pollutant receiving pollution. Contract and processing records should be kept in file;

2. Standardized mobile laboratory service providers should sign laboratory wastewater treatment contracts with the local WWTPs, and perform the linked list system. Moreover, according to the storage capacity of the laboratory wastewater, sewage should be deliver to the local WWTPs in one or two weeks. Standardized mobile laboratory should keep the treatment receipts for documenting.

3. The WWTPs should provide their discharge ports monitoring data to standardized mobile laboratory annually. Also, the monitoring data provided by the servicers to the counties (cities, districts) Program Offices, need to save as documents.

4. The reagents accidentally damaged during experiment shall be treated in a timely manner to prevent secondary pollution.

III. Solid Wastes

1. Make an inventory of test articles after each experiment to avoid omission.

2. The experiment garbage produced during test shall be disposed of by qualified organizations.

Appendix 3

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World Bank Loan Guangdong Compulsory Education Project

Site Specific Impact

Department of Education of Guangdong Province

Scientific Institute of Pearl River Water Resources Protection

June 2016

Site Specific Impact

The surrounding sensitive points and sensitive targets of civil engineering projects will be affected by different degrees during the construction period. At first, the sensitivity and the sensitive target are identified by SS and the corresponding mitigation measures as well as the construction of solid waste and school safety issues such as road traffic problems are put forward.

I. Recognition of environmental sensitive areas

1. Concept of environmental sensitive areas

Environmental sensitive areas refer to various natural and cultural reserves or areas that are sensitive to some pollution factors and ecological influence factors of the construction project, including:

1) Nature reserves, scenic spots, World Cultural and Natural Heritage Zones, drinking water source conservation areas;

2）Basic farmland protection areas, basic prairies, forest parks, geological parks, important wetlands, natural forests, concentrated areas of rare and endangered wild animals and plants, natural spawning grounds and feeding grounds for important aquatic organisms, wintering grounds and migration routes, natural fisheries, water-deficient areas, key areas for water and soil loss control, sealed conservation areas of decertified land, enclosed and semi-enclosed seas, eutrophication waters;

3) Districts with major functions of residence, medical health, culture and education, scientific research, administration affairs, culture relic protection sites and protected areas with special historical, cultural, scientific and national significance.

2. Recognition of environmental sensitive areas

Construction of noise pollution occurs mainly in the construction of four phases: Phase earthwork, foundation phase, structure phase and renovation phase. Noise comes mainly from a variety of construction equipment such as excavators used, loaders, trucks, etc., mostly discontinuity noise. Construction of noise is temporary; it can be restored after the end of construction. The main sources of noise generated by construction machinery intensity in the following table:

Table 1 Different Construction Stages Major Source of Noise Intensity

Equipments	Test Distances	Volume of Noise dB（A）	Equipments	Test Distances	Volumes of Noise dB（A）
Excavator	5	86	Concrete mixer	5	74
Heavy load truck	5	82	Bar cutter	5	75
Bulldozer	5	85	Metal beat	5	79
Loader	5	74	Electric saw	5	83
electric welding machine	5	73	Crane	5	65

According to predictions of noise in the range of about 100m peripheral construction site will be subject to varying degrees, but outside the range of 100m will be affected in a small degree. Environmental sensitive areas around the civil engineering of the project are recognized based on the above content, including residential buildings, village committees, elementary and secondary schools, sanitary stations, kindergartens, etc, detail data shown in Table 1 below.

Table 1 Recognition For Construction Surrounding Sensitive Area

Number	Areas	Schools' Official Names	Sensitive Spots	Distances (m)	Effect Populations (Human Units)
1	Chao'an District	Fuyang Town Liulian Primary School	Fuyang Center Kindergarten	90	544
2		Fengtang Town Zhiyong Middle School	Qiquan New Village	20	200
3		Jinshi Town Dazai Junior Middle School	Tiantou Village	30	200
4	Chaoyang District	Chaoyang District Zhaopu Middle School	Qianyang Village	100	200
5		Chaoyang District Jinzhaogangnei Primary School	Gangnei Village	100	200
6		Chaoyang District Jinzhaohuagang Primary school	Huagang Village	100	200

	7		Chaoyang District Chenlin Junior Middle School	Liugang Village	90	240
	8		Chaoyang District Donan Junior Middle School	Dongkeng Village	100	230
	9		Chaoyang District Dupu No.1 Junior Middle School	Zhaoshi Community	90	300
	10		Chaoyang District Jinzhaowaimei Primary School	Waimei Village	100	80
	11		Chaoyang District Jinzhaojingou Primary School	Jin'gou Village	100	200
	12	Dianbai District	Maoming Dianbai District Magang Town Center Primary School	Magang Village Community	65	200
	13		Maoming Dianbai District Lingmen Town Center Primary School	Luling New Village	30	1200
	14		Maoming Dianbai District Lingmen Town Danbu Primary School	Danbu Village	50	400
	15		Maoming Dianbai District Lingmeng Town Shanqian Primary School	Shanqian Village	50	400
	16		Maoming Dianbai District Xiaoliang Town Nanhua Primary School	Lingya Village, Keni Village	100	1500
	17		Maoming Dianbai District Poxin Town Zhengchun Primary School	Tanpizi Village	50	300
	18		Maoming Dianbai District Poxin Town Niuliujia Primary School	Xiban Village	100	40
	19		Maoming Dianbai District Lintou Town Liantang Primary School	Liantang Village, Liushuitang Village	100	300

20		Maoming Dianbai District Lintou Town Dayadapo Primary School	Dapo Village	50	680	
21		Maoming Dianbai District Huanglin Town Shangpingshan Primary School	Pingshan Village	50	2000	
22		Maoming Dianbai District Luokeng Town Lilian Primary School	Muji Po	50	60	
23		Maoming Dianbai District Nahuo Town Malu Primary School	Guidian Village	50	210	
24		Maoming Dianbai District Nabuo Town Shuishi Primary School	Yatong Village , Shuitoushan Village, Lianfang Village and Dapo Village	80	120	
25		Maoming Dianbai District Wangfu Town Center Primary School	Wangfu Middle School, Wangfu Hosptial, Wubeigang Village, Poweizai Village	Wangfu Middle School 60m, Wubeigang Village 100m	Wangfu Middle School 1700, Wubeigang Village 30	
26	Haifeng County	Qiaodong Primary School	Qiaodong Community	30	580	
27		Lianhua Middle School	Dahu Village	80	350	
28		E'bu Middle School	E'bu Village	30	160	
29		Huangqiang Middle School	Huangqiang Town Nuring House, Huangqiang Town Center kindergarten	Wangqiang Town Nurning House 78m	320	

	30		Meilong Center Primary School	Haifeng County Meilong Village Linfengtian Hospital, Xiaotaiyang Kindergarten	Haifeng County Meilong Village Linfengtian Hospital 99m	360
	31		Cikeng Center Primary School	Qingkengyu Village	40	130
	32		Ketang Center Primary School	Ketang Fangfang Kindergarten, Ketang Xu	Ketang Xu 99m	430
	33		Gongping Center Primary School	Yangguang Kindergarten, Changxi Commuity	40	230
	34		Huangqiang Center Primary School	Huangqiang Town Hospital	85	130
	35		Houmen Center Primary School	Houmen Xu	58	150
	36		Huangqiang Linchang School	Lu'an Village	90	80
	37	Huazhou	Baoxu Town Center Primary School	Shuijingtou Village, Jiefang Village, Longhu Developing District	50	700
	38		Huazhou Baoxu Middle School	Hedong Developing District, Zhongjianbu Village	15	600
	39		Poyang Town Center Primary School	Poyang Town No.2 Middle School, Xin Village	Xin Village 75m	130

	40		Changqi Town Nanling Primary School	Nanling Village Commuity Building	Nanling Village Commuity Building 100 m	7
	41		Daqiao Town Center Primary School	Daqiao Town Hospital, Daqiao Village	Hospital 290m, Daqiao Village 130m	9880
	42		Hejiang Town Liulong Primary School	Liuduipo Village, Bandong Village	100	800
	43		Hejiang Town Lingjiang Junior Middle School	Yijingya Yuan, Electricity Building and Fulian Kindergarten, Electricity Office	45m、40m、10m	600
	44		Jianghu Town Center Primary School	Jianghu Hubian Dalubian Village	100	80
	45		Linchen Town Ling Village Primary School	Ling Village	100	
	46		Nawu Town Dawangdong Primary School	Lizhuwei Village	50	210
	47		Nansheng Middle School	Nansheng Town	40	500
	48		Shenggu Junior Middle School	Tianhelang Village, Baotangpo Village	10	500

	49		Pingding Town Center Primary School	Pingding Center Kindergarten, Pingding Town Center School, Fangfang Kindergarten, Pingding Middle School	Pingding Center Kindergarten 50m, Pingding Middle School 50m	560
	50		Pingding Town Shenggu Primary School	Shenggu Village No.1 Hospital, Shenggu Village	Hospital 45m	90
	51		Welou Town Center Primary School	Wenlou Village, Wenlou Middle School	30	600
	52		Huazhou Wenlou Middle School	Wenlou Village	30	50
	53		Xin'an Town Center Primary School	Xin'an Middle School, Developing District	50	550
	54		Yangmei Town Center Primary School	Jiaoshi Village, Houses, Town Animal Hospital	100	800
	55		Lanshan Center Primary School	Lanshan Village	40	250
	56		Zhongdong Town Nahong Primary School	Xianglushan Village	10	5
	57		Zhongdong Town Potou Primary School	Dalu Village, Shaoganpo Village, Shantouling Village	Dalu Village 10m, Shaoganpo Village 100m	200
	58		Zhongdong Town Shiling Primary School	Shangrao Village	10	300

59	Huilai County	Huiwei County Longjiang Town Center Primary School	Xiangbei Village	36	500	
60		Huilai County Aojiang Middle School	Aojiang Center Primary School, Aoshang Village	Aoshang Village 100m	200	
61		Huilai County Qingshan Middle School	Pangxie School	84	128	
62		Huilai County Qianzhan Middle School	Houshan Village	20	107	
63		Huilai County Bingying School	Malong Lake Village	20	187	
64		Xian'an Town Xizhuang Primary School	Xizhuang Village	30	250	
65		Kuitan Town Sanchipu Primary School	Shanchipu Village	20	250	
66		Kuitan Nongchang Center Primary School	Aojiang Town	30	714	
67		Dongpuchang Center Primary School	Dongpu Middle School	54	251	
68		Xixi Middle School	Xixi Village	30	550	
69		Nanqiao Chiyu Primary School	Qiaochang Middle School	100	916	
70	Jiexi County	Jiexi County No.4 Huaqiao Middle School	Huazhai Village	95	150	
71	Leizhou	Yingli Middle School	Lele Kindergarten, Yingli Town Center Primary School	Lele Kindergarten 55m	Lele Kindergarten 194m	
72		Longmen No.3 Middle School	Leizhou Longmen No.2 Primary School, Xiaojingling Kindergarten	Xiaojingling Kindergarten 94m	290	

	73		Tangjia Center School	Tangjia Hospital	Qinglan Kindergarten 50m	120
	74		Jijia Center School	Jijia Town Center Kindergarten, Houtang Village	55	654
	75		Qishui Center School	Qishui Town Yumin Primary School	94	100
	76		Beihe Center School	Beihe Center Kindergarten, Beihe Middle School	Beihe Center Kindergarten 43m, Beihe Middle School 46m	Beihe Center Kindergarten 200, Beihe Middle School 500
	77	Lianjiang	Lianjiang Jishui Town Heling Primary School	Heling Primary School	40	120
	78		Anpu Town No.3 Middle School	Baozi Village	60	300
	79		Chang'an Town Changshan Middle School	Changshan Town	50	220
	80		Cheban Town No.1 Junior Middle School	Cheban Hospital, Maopozi	Cheban Hospital 74m, Maopozi 50m	200
	81		Heliao Town No.1 Junior Middle School	Heliao Town	30	200
	82		Hechun Town Hechun Middle School	Hechun Town	30	150
	83		Hengshan Town No.2 Junior Middle School	Kanzi Village	50	130
	84		Liangdong Town No.1 Junior Middle School	Liangdong Town	40	300
	85		Liangdong Town Liangdong Middle School	Linagdong Village	30	200

86		Shijiao Town No.2 Junior Middle School	Niaozi Bei	200	210	
87		Tangpeng Town Tangpeng Middle School	Shilanpo	50	220	
88		Yingzi Town No.2 Junior Middle School	Yingzi Town	50	150	
89		Yingzi Town Yingzi Middle School	Yingzi Village	30	160	
90		Xinmin Town Xinmin Middle School	Gaojie Village	20	60	
91		Lianjiang Shijiao Town Dandou Primary School	Dandou Village	30	230	
92		Shijiao Town Shanhe Primary School	Shanhe Village	30	220	
93		Lianjiang Shijiao Town Fengman Primary School	Fengman Village	30	220	
94		Lianjiang Shijiao Town Sanhe Primary School	Sanhe Village	30	200	
95		Lianjiang Shijiao Town Wenfeng Primary School	Shibeijiao	30	210	
96		Liangdong Town Watsons Chunlei Primary School	Chongshan Village	30	150	
97		Lianjiang Anpu Town No.4 Primary School	Anpu Town	50	160	
98		Lianjiang Qingping Town Xi'an Primary School	Xi'an Village	30	160	
99		Cheban Town Shangbu Primary School	Shangbu Village	30	180	
100		Lianjiang Cheban Town Duolang Primary School	Potoudong Village	30	130	
101		Yatang Town Tuo Village Primary School	Tuo Village	30	140	
102		Shijing Town Center Primary School	Potian Village	50	70	
103		Heliao Town Tangdu Primary School	Tangdu Village	30	200	
104		Heliao Town Fengfei Primary School	Laoxiejiao Village	30	120	

105		Heliao Town Hengjiangpo Primary School	Hengjiangpo Village	30	130
106	Lufeng	Lufeng Jieshi Town Jienan Middle School	Qiandun Village	30	120
107		Lufeng Bawan Middle School	Beixin Village	50	200
108		Lufeng Qiaochong Middle School	Datang Village Mingzhu Natural Village	80	200
109	Luoding	Luoping Center Primary School	Zhuwei Village	村内	150
110		Sulong Street Center Primary School	Yangqiao Village	20	150
111		Tanbin Town Center Primary School	Jiaobei Hole	100	200
112		Huashi Town Center Primary School	Zhaijiao Village	村内	150
113		Taiping Town Center Primary School	Huaxing Kindergarten, Dongmei Village	Kindergarten 102m，Village 50m	240
114		Jinji Town Center Primary School	Dagang Hospital	10	100
115		Jinji Town Center Primary School	Shijian Village	村 100	160
116		Huaqiao Middle School	Shengjiang Commuity	50	130
117		Doumen Middle School	Doumen Hospital	100	100
118		Jiayi Middle School	Jiayi Center Primary School, Jiayi Hospital	Primary School 205m, Jiayi Hospital 189m	200
119	Puning	Puning Nanjing Town Mingxiu Junior Middle School	Weijiao Village	70	200
120		Puning Nanjing Town Simu Primary School	Anjiao Village	Anjiao Village Range	130

	121		Puning Qilin Town Duixia Primary School	Duixia Village	Duixia Village Range	300
	122		Puning Daba Town Dongkeng Primary School	Dongkeng Village	50	300
	123		Puning Daba Town Macuozhai Primary School	Macuozhai Village	50	100
	124		Puning Gaopu Middle School	Yingxia Village	120	90
	125		Puning Chuanpu Town Meitian Primary School	Meitian Village	Meitian Village Range	200
	126		Puning Houxi Village Pulou Primary School	Tangzichun Village	20	230
	127		Punning Houxi Village Pingyang Primary School	Pulou Village	66	250
	128	Suixi County	Jianghong Town Junior Middle School	Houliao Village, Nuring House	Houliao Village 25m, Nuring House 30m	250，12
	129		Chengyue Town Center Primary School	Chengyue No.1 Junior Middle School	98	100
	130		Leilin Junior Middle School	Jixiang Xiaoqu	100	720
	131		Gangmen Town Center Primary School	Xingang Village	100	150
	132		Hetou Town Center Primary School	Hetou Middle School	50	146
	133		Lemin Town Diaoshen Primary School	Diaoshen Village	30	130
	134		Lemin Town Yu Village Primary School	YuchunVillage Commuity	20	10

135		Leimin Town Center Primary School	Lemin Village, Lemin Center Kindergarten, Lemin Village Commuity	Lemin Village 30m, Lemin Center Kindergarten 100m, Lemin Village Commuity 50m	150，280，8
136		Qingyang Town Shagu Junior Middle School	Shagu Center Primary School	94	150
137		Qingyang Town Shagu Center Primary School	Shagu Junior Middle School	94	280
138	Wengyuan County	Jiangwen Town Center Primary School	Jiangwei Town Middle School	85	140
139	Wuchuan	Wuchuan Zhongshan Center Primary School	Huangpo Center Kindergarten	92	280
140		Wuchuan Lanshi Center Primary School	Lanshi Village	80	100
141		Wuchuan Tangzhui Town No.2 Primary School	Tangzhui Town	100	120
142	Wuhua County	Wuhua County No.1 Primary School	Shuizhai Town Dabu Village (Village in Town)	40	90
143		Wuhua County Huayang Town No.1 Primary School	Huayang Town Huayang Village	100	100

II. Environmental mitigation measures in sensitive areas

Environmental mitigation measures for surrounding sensitive areas are mainly reflected in the construction period, including influences and measures of atmospheric environment and acoustic environment. Specific influence factors and measures are as

follows:

1. Influence factors and measures of atmospheric environment

Influence factors of the project in the construction period mainly include construction dust.

Construction dust include dust generated by vehicles, wind dust in the open storage ground and exposed sites, lime-soil mixing, and onsite wind dust, etc. Construction dust will contaminate the surrounding ambient air quality and affect the health and operation of constructors.

1) Dust by vehicles

2) Dust in the storage ground of materials

3) Mixing dust

2. Mitigation measures of influence on atmospheric environment

1) Control of transport dust

(1) Strengthen transportation management to ensure vehicles at the required speed.

(2) Choose transport route scientifically.

(3) Regular watering on the transport route.

(4) Dusty materials should be packaged by tanks or bags while coal ash should be wetted to package and transport. No overload is allowed when transporting soil, cement, lime and other dusty materials. Tarpaulin should be used when transporting such materials. It should be immediately cleaned if there is any leakage.

2) Dust control in construction sites

(1) Mitigation measures for lime-soil mixing dust and cement-concrete mixing dust. The following measure should be applied for lime-soil mixing dust: To arrange reasonable mixing sites and concentrate the mixing. Try to reduce the mixing sites. Lime-soil mixing sites should not be in the upwind direction of sensitive areas, instead it should be at least 200m away. Equip operators in the mixing sites with masks and goggles to protect their health. The following measure should be applied

for cement-concrete mixing dust: To concentrate the mixing of cement and concrete and to transport it in sealed tanks. Advanced cement-concrete mixing equipment and supporting dust-removal equipment should be applied. Cement-concrete mixing sites should not be in the upwind direction of sensitive areas, instead it should be at least 300m away. Operators should be equipped with masks and goggles. A shift system and periodic physical examinations should be applied.

(2) Mitigation measures for dusts in the storage sites: Storage sites of road construction materials should be in the downwind direction of the sensitive area with a distance of at least 100m. In case of bad weather, tarpaulin should be applied to cover the materials. Pay attention to the reasonable arrangement of storage sites and protective measures for coal ash, reduce the storage volume and use it timely. A fence should be set if necessary and regular watering is needed to control the dust.

3. Influence factors and measures of acoustic environment

1) Transportation noise

Transportation noise is mainly the vehicle noise which can be roughly categorized into the following groups: combustion noise, intake and exhaust noise, operation noise of fans, mechanical noise and car-body noise.

2) Construction machinery noise

On the project construction sites, with the different stages of progress of the project, different mechanical equipment will be applied, such as excavators, bulldozers, loaders, jackdrills, graders, and road rollers, etc. in the roadbed construction period as well as cement-concrete mixing equipment, mortar mixer, concrete grooving machines, cranes, asphalt pavers, etc. In addition, diesel generators, air compressors, axial fans, crushers are all strong noise sources.

The sound level of the above construction machinery at 5m is between 80-90dB while the sound level of transport vehicles at 7.5m is between 80-90dB.

3) Control of transport noise

(1) Reasonable planning of construction sites

To choose reasonable construction sites of projects and to avoid surrounding sensitive areas. To avoid the generation of noise pollution when planning.

(2) Transport routes

In sensitive sections such as schools, hospitals, residential areas and nursing homes along the travelling roads of vehicles, there should be no honking and vehicle speed should be limited.

(3) Labor protection

Operators should adopt self protection in a strong-noise operating environment.

4) Control of mechanical noises

(1) Reasonable site selection

For the site selection of residential areas of operators, large-scale construction sites, cement-concrete mixing sites and macadam court, try best to be far away from sensitive environmental areas such as schools, hospitals, kindergartens, nursing homes, and residential areas with a distance of at least 200m. Measures of noise elimination, sound insulation and vibration attenuation should be applied if above requirements are failed.

(2) Construction technologies of low noise and vibration should be applied

(3) Noise control of the construction in sensitive environmental areas

Set up a temporary sound insulation building envelope at the boundaries of the construction site. High-noise operations should avoid class hours of schools and the midday breaks of hospitals and nursing homes. Stop high-noise operations such as piling at night. When continuous operation is needed, it should be reported to the local environmental protection department for approval and to local residents. Take advantage of fixed holidays, summer vacations and winter vacations to perform certain specific high-noise operations.

III. Road transportation safety

According to field surveys, some schools are close to local bus terminals or national and provincial highways with large traffic flow, large population and potential traffic trouble.

Fig. 1 Transportation condition at the school gate of the Central Primary School of Lingmen Town

Fig. 2. The 325 National Road in the surroundings of the Central Primary School in Magang Town, Dianbai District, Maoming

Fig. 3. Transportation condition at the school gate of the Central Primary School of Jishui Town, Lianjiang City

Fig. 4 Transportation condition at the school gate of Shangying Middle School of Lufeng City

To further enhance the traffic safety education for students, enhance their awareness of traffic safety and civilized traffic, improve their awareness of traffic safety and self-protection in order to draw the attention of traffic safety from students, parents and even the public, further protect the travel safety of students, and minimize traffic accidents of students. Combining with the practical situation of the civil engineering project, safety education and prevention work should be well implemented to ensure the normal implementation of school work and healthy growth of students. Based on the road complexity, the following measures are made in schools with large traffic volume:

1. To further strengthen traffic safety education for students. Schools should conduct regular traffic safety education for students through a variety of forms to enhance the safety awareness of teachers and students and to enable students to learn more about traffic rules.

2. The safety duty system on crossings in the school should be implemented. The school should formulate and strictly implement a safety duty system on crossings and major traffic intersections. Responsibilities should be determined and personnel should be arranged. When classes are over, there should be teachers or students on duty to guide students to walk according to traffic rules. A duty record is needed.

3. During the construction period, the School Project Office should establish and implement an inspection system in the school and major segments by the school gate. An inspection team of school roads should be established. Leaded by certain leaders, the post, person and responsibilities should be determined. Responsibility management should be applied in the school. Special person should be arranged at rush hours when going to school and when classes are over to inspect the traffic condition of students in the school and at the school gate. Relevant records should be made.

4. During the construction period, the school should take the duty condition on crossings and road segments in the school into management and list it into the objective assessment of students, classes and teachers. A weekly statistics and a monthly report are needed.

5. Obvious warning signs should be set at the school gate or traffic intersections with concentrated students to remind motor vehicles to slow down when going in and out of the school. Uncorrelated motor vehicles are forbidden to go in or out of the school freely. The construction area should be separated from teaching and living areas by

erected warning sign; if standardized classrooms or teachers temporary houses constructed in the original teaching area or living zones, such as Jianwen Town Center Primary School teachers temporary houses, Lufeng City Lake Middle School teachers temporary houses, Luoding Dumen Middle School teachers temporary houses are constructed in the same areas of original teachers dormitory or complex buildings, we must first evacuate the original teachers, students and related persons, and partitioned manage the construction area. Teachers and students are not allowed enter the construction areas or operating areas (especially students), not allowed activities or stay in the region of construction. The person who has something important can't avoid pass by should walk out the area quickly.

6. Strictly implement the target-oriented responsibility system and accountability system of traffic safety and the president is the first responsible person. Based on the reality, the school should establish a thorough and operable responsibility system of traffic safety. To decompose tasks to each person to achieve the standardized and systematic traffic safety for students and to realize the prevention-oriented management object. Students suffering from traffic accidents should be sent to the hospital immediately. To determine the responsibility of each person.

7. During classes, teachers should try to shut the doors and windows to reduce the impact of noise, educate students concentrate on the classes without watching or listening to construction situations. Reduce the attention on construction. Teachers should guide students correctly.

8. Due to construction needs, the construction team would transport some material in the construction process, all the teachers and students through the construction zone should note that there is no vehicle through or handling delivery of material, to prevent being hit or hang injuries by a vehicle or building materials. Don't go through the door if loading materials affected passing until security.

9. All construction workers should do civilized construction, including no littering, no open defecation. All Vehicles should park or placed in accordance with school in designated areas. All construction persons should ensure the safety of teachers and students passing as a top priority, everything consider safety as first mission, to ensure construction processing as well as teacher and students safety. In the construction process, when teachers and student back or leaving the school in the morning, afternoon or at noon, workers should stop the crane transport building materials transport over teachers' and students' heads. Leaders should hold regular safety brief meeting, to discover or handing safety problems, to ensure that no security incidents during the construction period.

Appendix 4

THE WORLD BANK
Working for a World Free of Poverty

World Bank Loan Guangdong Compulsory Education Project

Environmental Management Framework

Department of Education of Guangdong Province

Scientific Institute of Pearl River Water Resources Protection

June 2016

Table of Contents

Chapter I Project Introduction and Objective

1.1 Project Introduction

This environmental management framework covers 3 sub-projects, i.e. standard classroom, standard mobile laboratories, and teacher temporary dormitories in poor remote rural areas; the 250 standardized classrooms involve 16 counties (cities/districts) in Guangdong Province, and bear an investment of approx. RMB 62.5 million; the 4 standard mobile laboratories involve 3 counties (cities/districts) in Guangdong Province, and bears an investment of approx. RMB 12 million; the 5200 teacher temporary dormitories in poor remote rural areas involve 16 counties (cities/districts) and bear an investment of approx. RMB 455 million.

1.2 Purpose

The total quantity for this project was determined before the World Bank launched its evaluation, including 250 standardized classrooms, 4 standard mobile laboratories, and 5200 teacher temporary dormitories in poor remote rural areas; however, the schools stated in application report presented by each county (city/district) may change during project implementation. This environmental management framework is developed to ensure the schools where change occurs (replaced schools) could be screened and managed based on site selection requirements and relevant provisions. Ensure all means is used to avoid or minimize environmental impact in all World Bank Loan-supported initiatives; for inevitable impacts, confirmation will be made based on relevant WB policies and Chinese laws, while necessary mitigation measures will be formulated and implemented. Environmental management framework consists of text, an attached table (Table 4), and an attached figure (Fig. 1); they established the school for determination and management of changes and the mechanism for public participation and the handling of possible public complaint, and cover specific screening tools recommended to be used for all sub-projects. In the operation manual are some associated additional technical guidelines for

environmental management framework; they are used as guidance for environmental impact assessment, and provide a screening tool to project environmentalists, including the specialists who work for project implementing body and the World Bank. The guidelines include important materials for project capacity building, and will be further modified and updated during project implementation so as to introduce the experience gathered.

1.3 Selection of Sub-project

Sub-project is defined as an activity of general project or a cluster of similar activities in individual counties (cities/districts) and one of key trades (infrastructure). Each sub-project is subject to the legal requirements of project, including financial requirements and safety assurance requirements. All sub-projects (schools) have to meet the following requirements:

1. The school where change occurs must be a school of compulsory education located in the defined 16 counties (cities/districts);
2. The new standardized classrooms or teacher temporary dormitories in poor remote rural areas of the school where change occurs must be within the range of school and accompanied by legal land use certificate;
3. The school where change occurs has to fully state the reasons when filing an application for standard classroom;
4. The school where change occurs must be located within reach of mobile laboratory when applying for standard mobile laboratories;
5. Teachers' temporary dormitories involve no teacher dormitory transformation.

The WB Project Team will validate the preliminary screening of project change qualification of project management office. When all sub-projects get prepared, the WB Project Team will preliminarily review and evaluate the ones considered

complicated. With respect to all other sub-projects, the WB Project Team will carry out sampling post-review during inspection mission visit to the relatively simple ones.

1.4 Policy Framework for Environmental Problems

Environment management framework is formulated in accordance with the following relevant state laws and regulations and safety control policies of WB.

1.4.1 Administrative Regulations of the State

Since 1980s, China has implemented EIA according to the requirements of Environmental Protection Law and relevant laws and regulations, as a documented procedure applicable to all investments in China. The laws and regulations on EP and water pollution control are closely related to this project.

1. Environmental Protection Law of the People's Republic of China (December 26, 1989);
2. PRC Environmental Impact Assessment Law (September 1, 2003);
3. Water Pollution Prevention and Control Law of the People's Republic of China (June 1, 2008);
4. Detailed Rules for the Implementation of the Water Pollution Prevention and Control Law of the People's Republic of China (March 20, 2000);
5. Law of the People's Republic of China on the Prevention and Control of Atmospheric Pollution (September 1, 2000);
6. Law of PRC on the Prevention and Control of Environmental Pollution by Solid Wastes (April 1, 2005);
7. Law of the People's Republic of China on the Prevention and Control of Environmental Noise Pollution (March 1, 1997);
8. Water and Soil Conservation Law of the People's Republic of China (March 1, 2011);
9. Regulations on the Administration of Construction Project Environmental Protection of PRC (November 1998);

10. Decision of the State Council on Several Issues Concerning Environmental Protection (GF [96] No.31, August 3, 1986);
11. Notice of the State Council on Issuing National Eco-Environmental Construction Planning (2012);
12. Notice of the State Council on issuing "the 12th Five-year" Energy Saving and Emission Reduction Comprehensive Work Program (GF[2011] No.26);
13. Regulations on the Administration of Construction Project Environmental Protection (No.253 Decree of the State Council, November 29, 1998).

1.4.2 Normative Documents

1. Integrated Wastewater Discharge Standard (GB8978-1996);
2. Environmental Quality Standard for Surface Water (GB3838-2002);
3. Ambient Air Quality Standard (GB3095-2012);
4. Acoustic Environmental Quality Standard (GB3096-2008);
5. Emission Standard for Odor Pollutants (GB14554-93);
6. Integrated Emission Standard of Air Pollutants (GB16297-1996);
7. Standard for Ambient Noise Emission at Building Construction Boundary (GB12523-2011);
8. Emission Standard for Community Noise (GB 22337-2008);
9. Pollution Control Standard for Storage and Treatment Spaces of General Industrial Solid Wastes (GB18599-2001);

1.4.3 Safety Control Policies of World Bank

Safety control policy of WB is made to ensure that due consideration is given to the environmental impact brought by the projects funded by WB, including analysis on the possible impact and measures to reduce the adverse impact. It is able to avoid damage to environment or affected populations other than completing project design, improving implementation efficiency and protecting reputation of WB and lending country. These potential subprojects will/may trigger the following policies of WB:

1. OP/BP 4.01 EA: This policy will be adopted on account of the nature of the project. It will filter the individual subprojects by OP 4.01 and divide into appropriate environment type. The technical guideline on "formation and implementation of EIA and environment management plan/cutting measures, including standards and code of environmental behavior adopted by contractor" will be incorporated into the workbook.
2. OP/BP 4.11 material cultural resource: All sub-items of this project are completed schools. In case that extension of some subprojects are found to contain reconstruction or protection of historical or archeological sites, such subprojects need to be provided with material culture resource management plan as an internal part or an independent report. It will review the environment assessment/environment management plans of all subprojects to determine its potential influence on the material culture resources and incorporate these procedures into all standard bidding documents so as to handle with the opportunity discovery problems that occur during the construction process. A technical guideline concerning "formation and implementation of material culture management plan" will be integrated into the workbook.

1.5 Methods for Resolving Issue of Environmental Safety Assurance

Environmental management framework is established to guide the preparation and standard compliance of environmental management plan during sub-project implementation. Since these sub-projects are confirmed successively and loan-supported during project implementation, the potential environmental impact screening and mitigation & management measures will be established based on the agreed environmental guarantee screening and evaluation framework.

Procedure

The following steps will be followed for sub-project screening and the establishment and implementation of environmental impact mitigating and management measures; the flow chart is shown in Fig. 1 below:

Step 1: Identify sub-project based on selection criteria and rules;

Step 2: The technical expert panel of provincial project management office determines sub-projects based on sub-project screening checklist (attached Table 4);

Step 3: The technical expert panel of sub-project defines the content of change based on site location, school size & location, as well as the existing conditions of sub-project;

Step 4: Raise appropriate environmental requirements and managerial requirements for the school where change occurs;

Step 5: Submit a report to provincial project management office and World Bank, and put the data on file;

Step 6: Take agreed actions, and carry out supervision, monitoring and evaluation.

Step 1 - Identify sub-project based on selection criteria and rules

Identify the modified sub-project based on attached Table 1 "sub-project screening checklist". These standards are described in the section "selection of sub-project". According to these standards, all sub-projects shall:

1. Comply with the first item of site selection requirement in attached Table 1; the qualification as the World Bank's sub-project will be canceled once the requirement is not satisfied;

2. Hold corresponding qualification certificates;

3. Meet the prior conditions for construction of standardized classrooms/temporary dormitories;

4. Have corresponding public participation process.

In Step 1, the environmentalist's /consultant experts of provincial project management office participate in the identification and selection of sub-projects. They

will evaluate and bring sub-projects into operation to optimize sub-projects' concept and minimize environmental impact. Attached Table 1 sets forth the preliminary screening guide for determining above-noted issues.

Step 2 - The technical expert panel of provincial project management office determines sub-projects based on sub-project screening checklist

Technical experts will identify applicable laws and regulations of China and the World Bank based on the screening of each sub-project; the identified and validated sub-projects will be immediately reported to the provincial project management office. In the meantime, data documents are put on file.

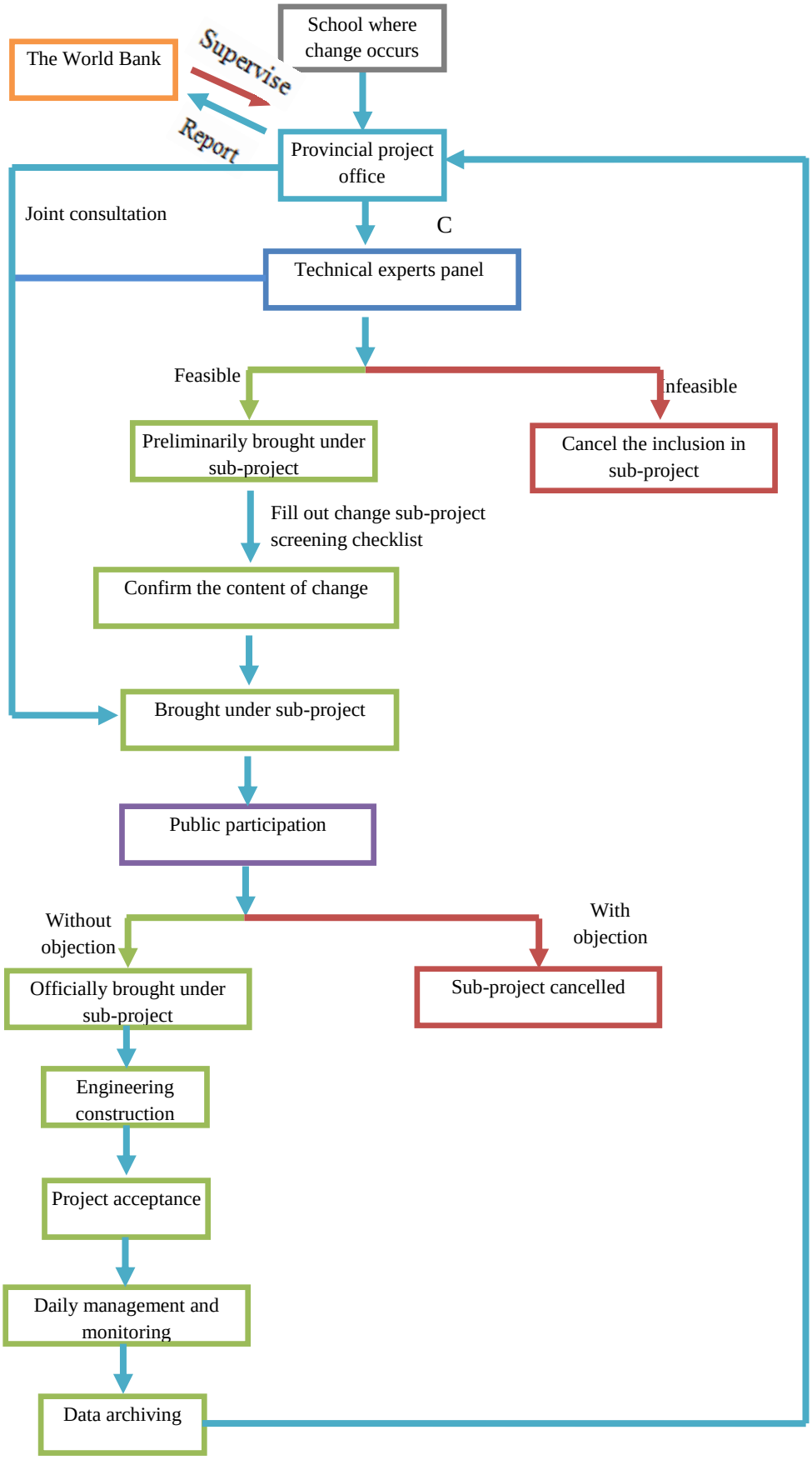


Fig. 1 Flow chart of the inclusion of the school where change occurs

Step 3 - The technical expert panel of sub-project defines the content of change based on site location, school size & location, as well as the existing conditions of sub-project, and puts forward corresponding comments

When the sub-project is brought under World Bank-supported project, the technical expert panel of sub-project defines the content of change based on site location, school size & location, as well as the existing conditions of sub-project, and puts forward corresponding comments. Upon the confirmation, the comments will be submitted to the provincial project management office, where the content of change is ultimately determined.

The above-noted process shall incorporate information disclosure and consultation & appeal handling processes.

Information publication and negotiation

Information disclosure and public negotiation is significant and essential for preparation and implementation of subproject. Such process enables the affected populations and other interest parties to participate in planning and implementation of the subproject and make certain contribution, thus to minimize its adverse influence and achieve maximum benefit. Level of public negotiation and coverage of information publication should correspond to the environment type and seriousness of the social impact.

Information to be disclosed should comprises the following at least：Design and influence of subprojects and proposed alleviating measures. In the phase of project design and implementation, the above information should be timely updated and continually reported to interested parties. And the information can be disclosed in several ways such as poster, handbook, newspaper, internet and community meeting. All of the safety control documents should be disclosed at a public place easily approached by affected populations and other interested parties before the negotiation begins in order to lay a foundation for it. The mechanism related to such disclosure and negotiation should be planned and specified in relevant safety control documents.

Complaint handling

If the affected individuals and organizes think that they are not treated properly in this project, it is necessary to establish a complaint handling mechanism to achieve a reasonable concern. Such mechanism should include: (1) Record and report system, including written and oral complaint; (2) being in charge of personnel designate by all levels of governments; (3) time limit for handling complaint. Besides, the mechanism will be specified in the safety control documents of the subproject. During implementation of the project, the PMO will carry out regular monitoring and assessment on execution of the complaint handling mechanism.

Step 4 - Raise appropriate environmental requirements and managerial requirements for the school where change occurs

Environmental protection mitigating measures are established to mitigate the environmental impact of project construction period and operation period. The environmental protection mitigating measures for civil works are different from that for standard mobile laboratories; refer to Annex 1 and 2 for specific ECOP. The school where change occurs is subject to respective management requirements.

Step 5: Submit a report to provincial project management office and World Bank, and put the data on file;

Put the data relevant to validated sub-project like official reply for EIA, relevant qualification and sub-project screening checklist on file.

Step 6: Take agreed actions, and carry out supervision, monitoring and evaluation Implementation

The sub-project developer shall carry out safety precautions during project implementation.

Supervision and inspection

The provincial PMO should be responsible for supervising the implementation of environment management plan and the social security related actions approved by governments and WB. The project group of WB will visit the project areas regularly in implementation period of the project, with the aim to:

1、Direct and assist to prepare safety control tools;

2、Review the screening results, examination report and safety control documents;

3、Supervise execution of safety control tools to determine whether it is conforming to the policies of WB.

Monitoring and appraisal

The provincial PMO will call in qualified and experiences consultant experts to monitor the plan, thus to get some critical information on the environment and effectiveness the alleviating measures. This is meaningful for the government and WB to make appraisal on the performance of environmental plan and take corrective actions when necessary. For the subprojects that need to prepare relocation action plan, the provincial PMO will employ acceptable third-party independent consultant experts from WB to conduct external monitoring on implementation of the plan. The report of external monitor will be submitted to WB and provincial PMO. The details of monitoring and appraisal are provided in Chapter VIII.

Chapter II Organizational Arrangement

When making the above mentioned environmental and social alleviating plan, organizations should take roles and responsibilities as below:

Environmental impact screening:

With the assistant of professionals and/or qualified consultant experts, the provincial PMO will conduct environmental screening to each planned subproject and WB will review the screening result based on the nature of subproject, impact type and scale.

Supervision and inspection: the provincial PMO will be responsible for providing directions on planning and implementation of safety control measures. The provincial and municipal technical departments will provide technical guidance, supervision and technical ability support to their counterpart department at county level.

General responsibility: the provincial PMO will be responsible for compiling and implementing the environment management plan for the project while WB will provide support by regular inspection and training.

Supervision, monitoring and appraisal: Guangdong Provincial Government will be wholly responsible for supervision, monitoring and appraisal on implementation of safety control documents. And the provincial PMO will plan, organize and direct the supervision, including appointing external environmental and social monitoring team.

Chapter III Capacity Building

Building local capacity is very critical to implementation of the above safety control activities. As for the local organizational arrangement, the local governments, especially county-level government should give effective support to the local capacity building to make their due responsibility fulfilled.

Capacity building concerning environment involves three aspects:
Firstly, the provincial PMO will determine the personnel demands at all levels and put forward suggestions on additional personnel;

Secondly, with support of WB, the provincial government will establish a series of planning, implementation tools and guidelines by modifying and updating the technical guidelines formulated in the environment management framework during the period of project appraisal. And such materials will be used for training in implementation period and reference of technician;

Thirdly, set out and implement training projects for environmental staff within scope of the project. And this task should be prioritized.

Attached List 1 Check List for Public Supporting Project Construction

No. Contract No. and name:

Project name: Copy:

Current construction stage: Reviewed by: Date:

Check item	Implemented or not			Remarks/recommended actions
	Yes	No	N/A	
1. Check before commencement				
1.1 Have you employed construction team?				
1.2 Has construction site been arranged and whether the construction mechanism is in normal condition?				
1.3 Do the constructors have Temporary Pass and wear them when going in and out?				
1.4 Is there project publicity tables posted at and surrounding the construction site?				
1.5 Have the construction protective equipments been prepared such as respirator, earplug, arcing protection glasses?				
1.6 Are the materials being used environment-friendly and nontoxic?				
1.7 Others (please specify)				
2. Air pollution control				
2.1 Is the construction site watered to reduce dust in dry condition?				
2.2 Have the vehicles transporting powder materials been covered and cleared before leaving the construction site?				
2.3 Have the dusty roads been water to reduce dust?				
2.4 Has it confirmed that the water used to reduce dust will not affect surface flow or the local community?				
2.5 Are the yards stacking powder materials being covered or watered to reduce dust; and are if the bags of cements are unpacked in a sheltered area?				
2.6 Have the transported goods are covered properly and lashed securely during transportation?				

Check item	Implemented or not			Remarks/recommended actions
	Yes	No	N/A	
2.7 Has the effect wind direction been considered when selecting places to pile materials?				
2.8 Is there any anti-wind and dust-controlling measures taken when piling the construction materials?				
2.9 If the construction vehicles run within speed limits?				
2.10 Are the residual powder materials cleared from the road when the piled materials are removed?				
2.11 Others (please specify)				
3. Water pollution control				
3.1 Is the drain tank being cleared regularly?				
3.2 Is the domestic sewage from construction personnel and the equipment cleaning-induced wastewater treated at original sewage treatment facility of the school (discharged into municipal piping network (if any) or treated with original three-stage septic tank where no municipal piping network is available)?				
3.3 Is the waste water treatment system (such as sedimentation tank) at construction site working and maintained normally?				
3.4 Do the constructors clean equipments before constructors leaving the construction site?				
3.5 Others (please specify)				
4. Noise pollution control				
4.1 Do the constructors comply with the laws and regulations relating to noise during construction?				
4.2 Is there a valid CNP provided during noise prohibited or limited period?				
4.3 Are the noise-making equipments placed				

Check item	Implemented or not			Remarks/recommended actions
	Yes	No	N/A	
in a closed room in running time?				
4.4 Are there low-noise equipments to be applied in construction period?				
4.5 Is the construction conducted in specified working hours so as to reduce noise pollution?				
4.6 Does the contractor maintain the construction equipments and try their best to keep it at best working condition and lowest noise level?				
4.7 Are the unused facilities at the construction site in off or energy-saving and vibration-controlling state?				
4.8 Have you got approval of relevant departments and conducted construction in specified period when in need of night construction?				
4.9 Others (please specify)				
5. Solid waste management				
5.1 Has a unit possessing environmental service qualification certificate been selected for solid waste treatment?				
5.2 Is the construction site in clean and tidy condition?				
5.3 Do you clear and classify the construction waste, reclaimable waste, general trash etc at the stacking yard periodically?				
5.4 Is there any greasy dirt spilling out during construction and if the polluted soil is cleaned timely?				
5.5 Are the residual wastes at the construction site removed timely and disposed properly after completion of the project?				
5.6 Is the domestic garbage transported by covered containers or tracks to designated garbage disposal places?				
5.7 Is there adequate area at the construction site for temporary storage of solid wastes?				

Check item	Implemented or not			Remarks/recommended actions
	Yes	No	N/A	
5.8 Others (please specify)				
6. Staff health and safety management				
6.1 Are there fire equipment equipped at camp, on-site facility and construction area?				
6.2 Are the machine operators and vehicle managers provided with operation certificate?				
6.3 Is the construction camp equipped with sufficient fire fighting equipments, fire hoses and hydrants for fire protection purpose?				
6.4 Do the constructors wear respirator, earplug, arcing protection glasses when necessary?				
6.5 Others (please specify)				

Attached List 2 Notice on Environmental Rectification

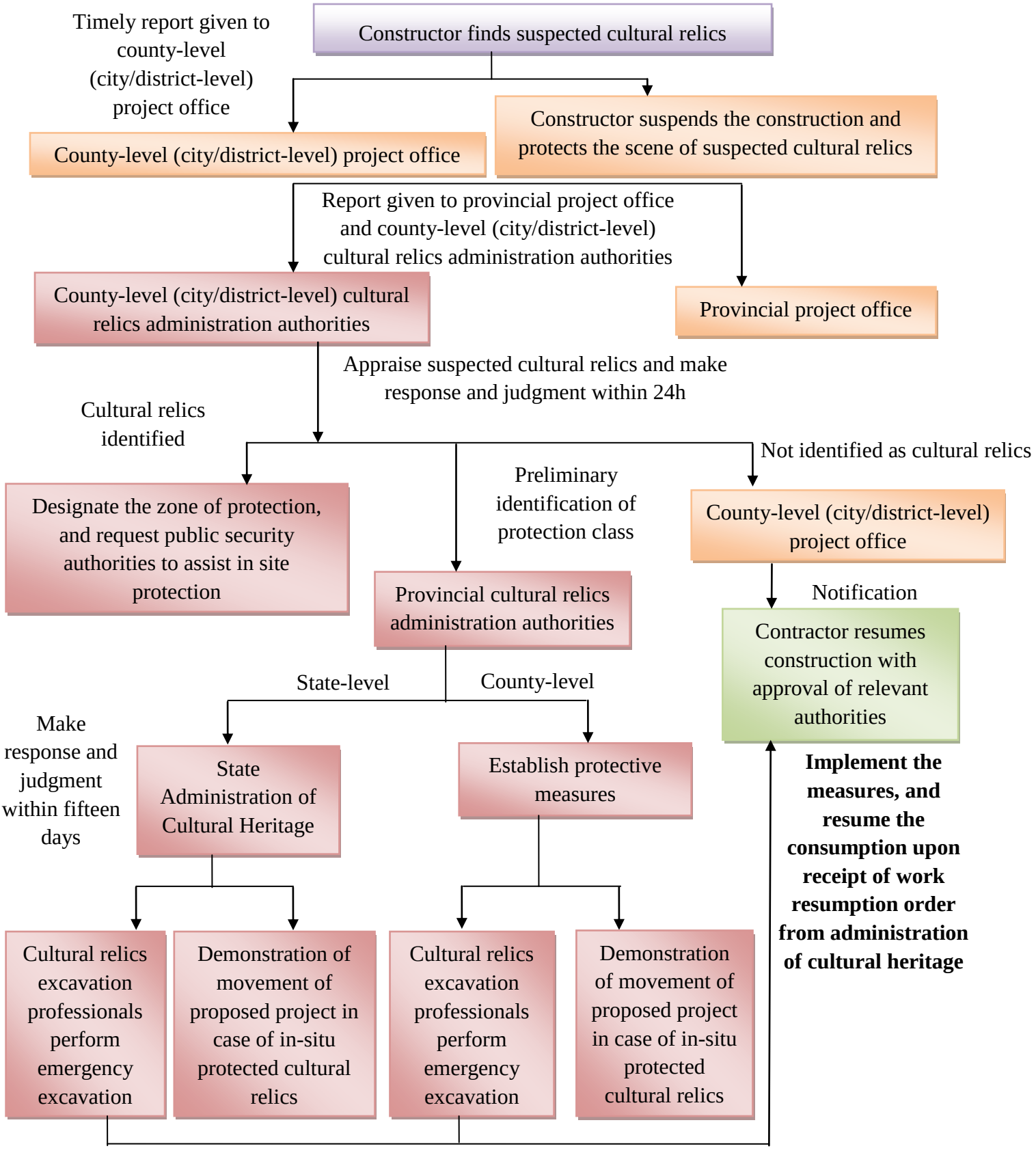
No.: Contract No. and name:

Project name: Copy:

Current construction stage: Date:

Problems discovered in on-site inspection:
Analyzed cause and improvement measure:
Rectification comments proposed by environmental authorities (when necessary):
Environment checker: Date: Time limit for rectification: complete within days Accepter: Date:
Conclusion of recheck: Rechecked by: Date:

Attached List 3 Cultural relic emergency preplan flow chart



Attached List 4 School modification program screening checklist

Date: No.:

School name: Contact information:

Address: Completed by:

Questions	Answers		Verification
	Y	N	
I. Requirements on Site Selection			
1. Is the school located in one of the 16 designated counties (cities/districts)?			□
2. Must the new standardized classrooms or teacher temporary dormitories in poor remote rural areas of the school where change occurs be within the range of school?			□
3. Must the school where change occurs be located within reach of mobile laboratory when applying for standard mobile laboratories?			□
4. If the school where change occurs applies for standardized classrooms/teacher temporary dormitories in poor remote rural areas, must such classrooms/dormitories be newly-built?			
II. Qualification Certification			
1. Is proposed project of the school where change occurs accompanied by land use certificate?			□
III. Other Requirements and Data			
1. What's the proportion of large class quota/ultra-large class quota classrooms if the school where change occurs applies for standardized classrooms?	%		□
2. If the school where change occurs applies for standard mobile laboratories, what's the percentage of existing high-value equipment & instruments of that school?	%		□
IV. Public Participation			
1. Did provincial project management office invite environmentalists to field survey of the school and have a relatively comprehensive understanding of present status of the school (environmental protection facilities and surrounding sensitive points)?			□
2. Did the provincial project management team launch "public participation" initiative for the school, including announcement, interview and public participation questionnaire form?			□
3. Are surrounding residents in support of the school development?			□
Signature of experts panel director: _____ Date: _____ Signature of Director of the Provincial Project Management Office: _____ Date: _____			

Note: The "Answers" column is filled out by relevant personnel of the school; once "N" is found in the "Answers" column, the school will not be brought under the WB project. The "Verification" column is ticked by project management office after on-the-spot verification.

Attached List 5 Public opinion survey (1) of environmental management plan for World Bank Loan Guangdong Compulsory Education Project

<table>
<tr><td>Name</td><td>Gender</td><td colspan="2">Age</td><td colspan="3">Nation</td><td>Education level</td></tr>
<tr><td></td><td></td><td colspan="2"></td><td colspan="3"></td><td></td></tr>
<tr><td>Position</td><td>Occupation</td><td colspan="2">Phone</td><td colspan="4">Dwelling place (Village, County, City)</td></tr>
<tr><td></td><td></td><td colspan="2"></td><td colspan="4"></td></tr>
<tr><td>Type of stakeholder (please check)</td><td>Project management office</td><td>School leaders or managerial personnel</td><td>Teachers</td><td>Students' parents</td><td>Students</td><td>Village residents</td><td>Other stakeholders</td></tr>
<tr><td colspan="8">This project is focused on the construction of standardized classrooms and teacher temporary dormitories in poor remote rural areas. Its construction period is 5 years (October 2016 - December 2021). Standardized classrooms and teacher temporary dormitories in poor remote rural areas involve 16 counties (cities/districts) in Guangdong Province; 250 standardized classrooms are to be built, the building area of each of which is 100m^2; the building area of each teachers temporary dormitory is 35m^2, and 5200 of them will be built.
The civil works of both standard classroom and temporary dormitory are located in the existing school. Principal pollution sources of sub-project are concentrated in construction period, including rainstorm-induced surface runoff, ground water, construction wastewater, domestic sewage, the dust resulting from the handling, transport and storage of building materials and the stockpiling and transport of excavation spoil, the exhaust from various construction machinery and transport vehicles, mechanical noise, construction noise and construction vehicles noise, as well as the surface excavation residue, residue soil & spoil and waste construction materials produced during construction etc. Pollution sources include domestic sewage and household garbage in operation period. In construction period, it's essential to rigorously define earth stockpiling spaces, properly manage construction wastes and household garbage, and have them cleared and disposed of in a timely manner; wastewater shall be timely treated with temporary drainage pipe and primary sewage sedimentation tank facilities and discharged into sewer system; exercise strict control over travel routes and operation specification of construction machinery, and rationally schedule the construction; clear residual silt & residue soil in a timely manner, and minimize dust emission etc. Domestic sewage shall be discharged into municipal piping network and properly treated at wastewater treatment plant during operation period; household garbage shall be collected and sent to landfill by environmental sanitation control authorities through ultra-low-noise equipment and vibration damping measures.</td></tr>
<tr><td>1. Do you know this project?</td><td>Yes</td><td colspan="2">Heard</td><td>No</td><td colspan="3">/</td></tr>
<tr><td>2. How did you learn</td><td>Bulletin board</td><td colspan="2">TV/newspaper/Internet/panel discussion</td><td>Local residents</td><td colspan="3">Others</td></tr>
</table>

	about this project?				
3.	What's your attitude to this project?	Support	Objection	Don't know	/
4.	What do you think about project site selection?	Reasonable	Unreasonable	Don't know	/
5.	What do you think is the impact of project development on local economic development?	Promotion	Inhibition	No difference	Don't know
6.	Are your satisfied with the present status of local environmental quality?	Very satisfied	Substantially satisfied	Dissatisfied	Don't know

7.	What do you think is the most important environmental problem here?	Water pollution	Atmospheric pollution	Noise	Ecological damage	Household garbage
8.	What do	Water	Atmospheric	Noise	Ecological	Household

you think is the most important environmental problem in newly-built school/teachers temporary dormitories?	pollution	pollution		damage	d garbage
9. Which do you think is the key stage of environmental problem in newly-built school/teachers temporary dormitories?	Before the entry into construction site	Construction period		Trial operation period	Operation period
10. Which do you think is the aspect of local environment most significantly affected by project development?	Aquatic environment	Atmospheric environment		Ecological environment	Noise environment
11. What do you think are the	Pollution abatement	Reduction in energy consumption		Quality improvement	/

principal environmental benefits of this project?				
12. What's the most significant impact of this project on your and local residents' interests?	Increase of income	Environmental improvement	Employment increase	Knowledge expansion
13. What do you think should be enhanced next to assure the successful project implementation?	Publicity & education	Training	Organization and implementation of monitoring & evaluation	Supervision in construction period
14. Do you have any comments or suggestions on project development and environmental protection?				

15. Do you have any difficulty or expectation for project implementation & development?	Take into account such aspects as environmental protection facilities, training & instruction and fund allowance, etc.

Note: This table applies to newly-built school and teachers temporary dormitories (domestic sewage is discharged via municipal piping network into wastewater treatment plant, where it is treated and discharged after standard compliance)

Attached List 6 Public opinion survey (2) of environmental management plan for World Bank Loan Guangdong Compulsory Education Project

Name	Gender	Age	Nation	Education level
Position	Occupation	Phone	Dwelling place (Village, County, City)	

Type of stakeholder (please check)	Project management office	School leaders or managerial personnel	Teachers	Students' parents	Students	Village residents	Other stakeholders

This project is focused on the construction of standardized classrooms and teacher temporary dormitories in poor remote rural areas. Its construction period is 5 years (October 2016 - December 2021). Standardized classrooms and teacher temporary dormitories in poor remote rural areas involve 16 counties (cities/districts) in Guangdong Province; 250 standardized classrooms are to be built, the building area of each of which is 100m^2; the building area of each teacher's temporary dormitory is 35m^2, and 5200 of them will be built.

The civil works of both standard classroom and temporary dormitory are located in the existing school. Principal pollution sources of sub-project are concentrated in construction period, including rainstorm-induced surface runoff, ground water, construction wastewater, domestic sewage, the dust resulting from the handling, transport and storage of building materials and the stockpiling and transport of excavation spoil, the exhaust from various construction machinery and transport vehicles, mechanical noise, construction noise and construction vehicles noise, as well as the surface excavation residue, residue soil & spoil and waste construction materials produced during construction etc. Pollution sources include domestic sewage and household garbage in operation period. In construction period, it's essential to rigorously define earth stockpiling spaces, properly manage construction wastes and household garbage, and have them cleared and disposed of in a timely manner; wastewater shall be timely treated with temporary drainage pipe and primary sewage sedimentation tank facilities and discharged into sewer system; exercise strict control over travel routes and operation specification of construction machinery, and rationally schedule the construction; clear residual silt & residue soil in a timely manner, and minimize dust emission etc. Provided that the urban wastewater system has not been established or is under construction in the operation period, the development of municipal piping network and wastewater treatment plant shall be accelerated, while domestic sewage shall be disposed of with buried integrated wastewater treatment facility, and shall not be discharged unless national sewage drainage standard is satisfied. Household garbage shall be collected and sent to landfill by environmental sanitation control authorities through ultra-low-noise equipment and vibration damping measures.

1. Do you know this project?	Yes	Heard	No	/
2. How did you learn about this project?	Bulletin board	TV/newspaper/Internet/panel discussion	Local residents	Others
3. What's your	Support	Objection	Don't know	/

attitude to this project?				
4. What do you think about project site selection?	Reasonable	Unreasonable	Don't know	/
5. What do you think is the impact of project development on local economic development?	Promotion	Inhibition	No difference	Don't know
6. Are your satisfied with the present status of local environmental quality?	Very satisfied	Substantially satisfied	Dissatisfied	Don't know

7. What do you think is the most important environmental problem here?	Water pollution	Atmospheric pollution	Noise environment	Ecological damage	Household garbage
8. What do you think is the most important environmental problem in newly-built school/teachers temporary dormitories?	Water pollution	Atmospheric pollution	Noise environment	Ecological damage	Household garbage

9. Which do you think is the key stage of environmental problem in newly-built school/teachers	Before the entry into construction site	Construction period	Trial operation period	Operation period

temporary dormitories?				
10. Which do you think is the aspect of local environment most significantly affected by project development?	Aquatic environment	Atmospheric environment	Ecological environment	Noise environment
11. What do you think are the principal environmental benefits of this project?	Pollution abatement	Reduction in energy consumption	Quality improvement	/
12. What's the most significant impact of this project on your and local residents' interests?	Increase of income	Environmental improvement	Employment increase	Knowledge expansion
13. What do you think should be enhanced next to assure the successful project implementation ?	Publicity & education	Training	Organization and implementation of monitoring & evaluation	Supervision in construction period
14. Do you have any comments or suggestions on project development and environmental protection?				

15. Do you have any difficulty or expectation for project implementation & development?	Take into account such aspects as environmental protection facilities, training & instruction and fund allowance, etc.

Note: 1. This table is applicable to newly-built schools and teachers temporary dormitories (urban wastewater system has not been established or is under construction, so domestic sewage is temporarily treated with buried integrated wastewater treatment facility)

Attached List 7 Public opinion survey (3) of environmental management plan for World Bank Loan Guangdong Compulsory Education Project

Name	Gender	Age	Nation	Education level
Position	Occupation	Phone	Dwelling place (Village, County, City)	

Type of stakeholder	Project management office	School leaders or managerial personnel	Teachers	Students' parents	Students	Village residents	Other stakeholders

This project is focused on standard mobile laboratories. Standard mobile laboratories involve 3 counties (cities/districts) in Guangdong Province, and are carried by buses, which are 12m in length, 2.55m in width, 3.95m in height and 6.05m in wheel base and furnished with passenger seats. The facilities include test stand, floor, water supply system, power supply system, air-conditioning system, ventilation system, early warning & escape system, video monitoring system and wastewater recycling system.

Only complete sets of equipment for mobile laboratory are purchased for the standard mobile laboratories. The pollution sources of this sub-project include experiment wastewater produced during normal operation, some automobile exhaust and abandoned articles from experiments. The experiment wastewater produced in this project is transported by the company that provides service for purchase of mobile laboratories to a nearby wastewater treatment plant with sewage receiving capacity and the qualification for treatment of lab wastewater, and the disposal route of lab wastewater shall be monitored. Abandoned wastes and test materials from experiments shall be properly sourced based on teaching material and delivered to a qualified organization for recycling & treatment.

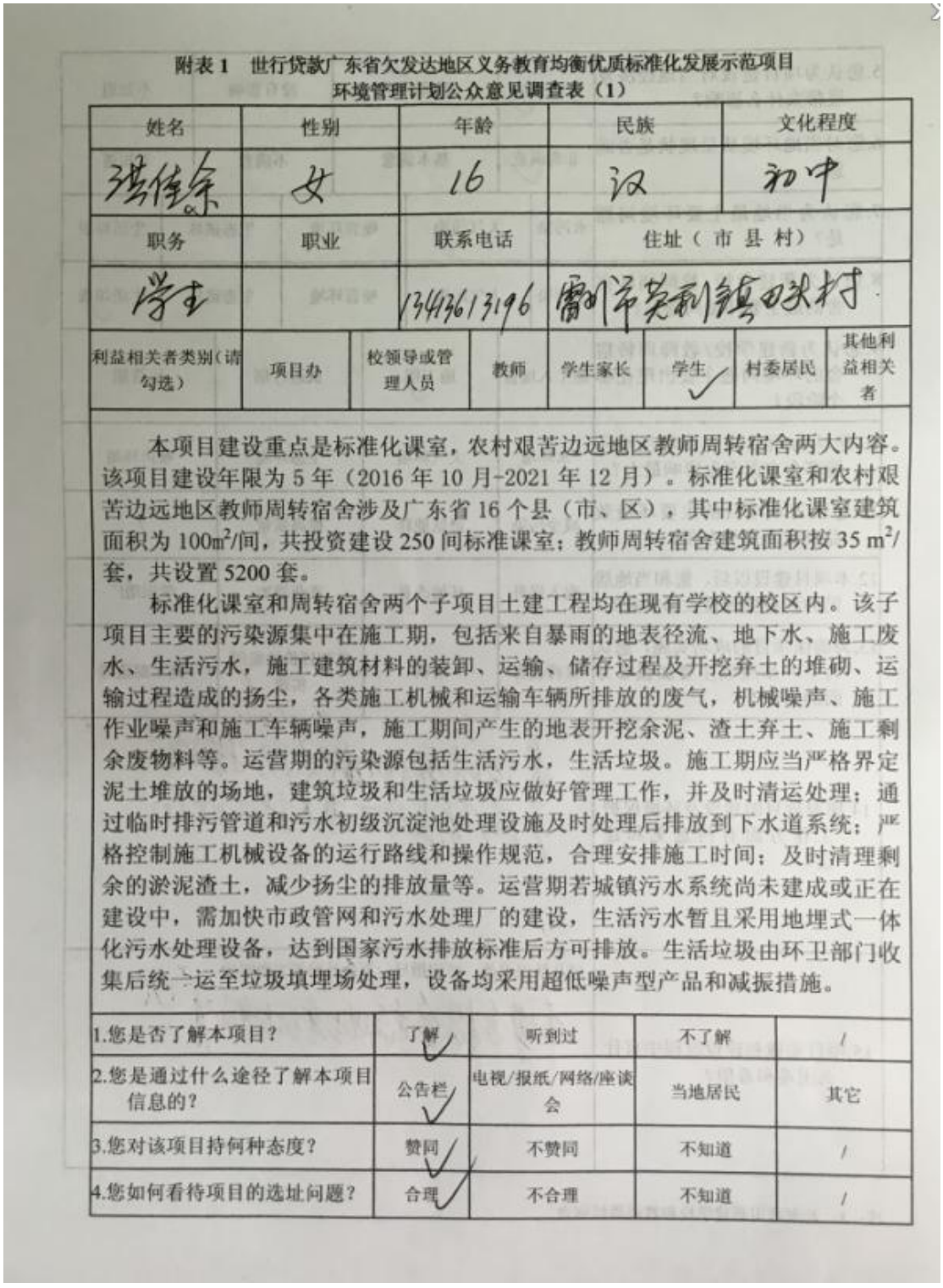
1. Do you know this project?	Yes	Heard	No	/
2. How did you learn about this project?	Bulletin board	TV/newspaper/Internet /panel discussion	Local residents	Others
3. What's your attitude to this project?	Support	Objection	Don't know	/
4. What do you think about project site selection?	Reasonable	Unreasonable	Don't know	/

5. What do you think is the impact of this project on local economic development?	Promotion	Inhibition	No difference	Don't know	
6. Are your satisfied with the present status of local environmental quality?	Very satisfied	Substantially satisfied	Dissatisfied	Don't know	
7. What do you think is the most important environmental problem here?	Water pollution	Atmospheric pollution	Noise environment	Ecological damage	Household garbage
8. What do you think is the most important environmental issue of standard mobile laboratories?	Aquatic environment	Atmospheric environment	Solid wastes	Noise environment	Ecological damage
9. Which stage do you think carry the main environmental issues of standard mobile laboratories?	Before the entry of vehicle	During experiment	After experiment	After the departure of vehicle	
10. What do you think are the principal environmental benefits of	Pollution abatement	Reduction in energy consumption	Quality improvement	/	

this project?				
11. What's the most significant impact of this project on your and local residents' interests?	Increase of income	Environmental improvement	Employment increase	Knowledge expansion
12. What do you think should be enhanced next to assure the successful project implementation?	Publicity & education	Training	Organization and implementation of monitoring & evaluation	Supervision in construction period
13. Do you have any comments or suggestions on project development and environmental protection?				
14. Do you have any difficulty or expectation for project implementation?	Take into account such aspects as environmental protection facilities, training & instruction and fund allowance, etc.			

Note: This table applies to standard mobile laboratories

Attached List 8 Original scan of public participation opinions



附表 1　世行贷款广东省欠发达地区义务教育均衡优质标准化发展示范项目
环境管理计划公众意见调查表（1）

姓名	性别	年龄	民族	文化程度
洪佳余	女	16	汉	初中
职务	职业	联系电话	住址（市 县 村）	
学生		13443613196	翻身英利镇田头村	

利益相关者类别（请勾选）	项目办	校领导或管理人员	教师	学生家长	学生 ✓	村委居民	其他利益相关者

本项目建设重点是标准化课室，农村艰苦边远地区教师周转宿舍两大内容。该项目建设年限为 5 年（2016 年 10 月-2021 年 12 月）。标准化课室和农村艰苦边远地区教师周转宿舍涉及广东省 16 个县（市、区），其中标准化课室建筑面积为 100㎡/间，共投资建设 250 间标准课室；教师周转宿舍建筑面积按 35 m^2/套，共设置 5200 套。

标准化课室和周转宿舍两个子项目土建工程均在现有学校的校区内。该子项目主要的污染源集中在施工期，包括来自暴雨的地表径流、地下水、施工废水、生活污水，施工建筑材料的装卸、运输、储存过程及开挖弃土的堆砌、运输过程造成的扬尘，各类施工机械和运输车辆所排放的废气，机械噪声、施工作业噪声和施工车辆噪声，施工期间产生的地表开挖余泥、渣土弃土、施工剩余废物料等。运营期的污染源包括生活污水，生活垃圾。施工期应当严格界定泥土堆放的场地，建筑垃圾和生活垃圾应做好管理工作，并及时清运处理；通过临时排污管道和污水初级沉淀池处理设施及时处理后排放到下水道系统；严格控制施工机械设备的运行路线和操作规范，合理安排施工时间；及时清理剩余的淤泥渣土，减少扬尘的排放量等。运营期若城镇污水系统尚未建成或正在建设中，需加快市政管网和污水处理厂的建设，生活污水暂且采用地埋式一体化污水处理设备，达到国家污水排放标准后方可排放。生活垃圾由环卫部门收集后统一运至垃圾填埋场处理，设备均采用超低噪声型产品和减振措施。

1.您是否了解本项目？	了解 ✓	听到过	不了解	/
2.您是通过什么途径了解本项目信息的？	公告栏 ✓	电视/报纸/网络/座谈会	当地居民	其它
3.您对该项目持何种态度？	赞同 ✓	不赞同	不知道	/
4.您如何看待项目的选址问题？	合理 ✓	不合理	不知道	/

5.您认为项目建设对当地经济发展带来什么影响?	促进作用✓	阻碍作用	没有影响	不知道
6.您对当地环境质量现状是否满意?	非常满意✓	基本满意	不满意	不知道
7.您认为当地最主要环境问题是?	水污染	大气污染✓	噪音环境	生态破坏	生活垃圾
8.您认为新建学校/教师周转宿舍的最主要环境问题是?	水污染	大气污染	噪音环境	生态破坏	生活垃圾✓
9.您认为新建学校/教师周转宿舍的环境问题主要出现在哪个阶段?	施工入场前	施工期✓	试运行期	运营期
10.您认为项目建设后对当地环境哪个方面产生影响最大?	水环境✓	大气环境	生态环境	噪声环境
11.您认为本项目的主要环境效益表现为那些方面?	减少污染	降低能耗	提高质量✓	/
12.本项目建设以后，您和当地居民的利益受到最大影响是?	收入提升	环境改善✓	就业增加	学识增广
13.为确保项目的成功实施，您认为下一步应该主要加强哪方面的工作?	宣传教育	培训	监测评价的组织实施✓	施工期监理
14.您对项目的建设及环境保护工作方面有何意见和建议?	建设时要做好预防措施，严格禁止学生进入施工现场。			
15.项目实施和建设过程中有什么困难和希望?	可从环保设施、培训指导、资金补贴等方面提出。 希望多投资搞好基础教育			

注：1、此表适用新建学校和教师周转宿舍

附表 1　世行贷款广东省欠发达地区义务教育均衡优质标准化发展示范项目
环境管理计划公众意见调查表（1）

姓名	性别	年龄	民族	文化程度
[illegible]	男	43	汉	本科
职务	职业	联系电话	住址（ 市 县 村）	
	老师	18023157808	[illegible]	

利益相关者类别（请勾选）	项目办	校领导或管理人员	教师	学生家长	学生	村委居民	其他利益相关者
				✓			

本项目建设重点是标准化课室，农村艰苦边远地区教师周转宿舍两大内容。该项目建设年限为 5 年（2016 年 10 月-2021 年 12 月）。标准化课室和农村艰苦边远地区教师周转宿舍涉及广东省 16 个县（市、区），其中标准化课室建筑面积为 100m^2/间，共投资建设 250 间标准课室；教师周转宿舍建筑面积按 35 m^2/套，共设置 5200 套。

标准化课室和周转宿舍两个子项目土建工程均在现有学校的校区内。该子项目主要的污染源集中在施工期，包括来自暴雨的地表径流、地下水、施工废水、生活污水，施工建筑材料的装卸、运输、储存过程及开挖弃土的堆砌、运输过程造成的扬尘，各类施工机械和运输车辆所排放的废气，机械噪声、施工作业噪声和施工车辆噪声，施工期间产生的地表开挖余泥、渣土弃土、施工剩余废物料等。运营期的污染源包括生活污水，生活垃圾。施工期应当严格界定泥土堆放的场地，建筑垃圾和生活垃圾应做好管理工作，并及时清运处理；通过临时排污管道和污水初级沉淀池处理设施及时处理后排放到下水道系统；严格控制施工机械设备的运行路线和操作规范，合理安排施工时间；及时清理剩余的淤泥渣土，减少扬尘的排放量等。运营期若城镇污水系统尚未建成或正在建设中，需加快市政管网和污水处理厂的建设，生活污水暂且采用地埋式一体化污水处理设备，达到国家污水排放标准后方可排放。生活垃圾由环卫部门收集后统一运至垃圾填埋场处理，设备均采用超低噪声型产品和减振措施。

1. 您是否了解本项目？	了解	听到过 ✓	不了解	/
2. 您是通过什么途径了解本项目信息的？	公告栏	电视/报纸/网络/座谈会 ✓	当地居民	其它
3. 您对该项目持何种态度？	赞同 ✓	不赞同	不知道	/
4. 您如何看待项目的选址问题？	合理 ✓	不合理	不知道	/
5. 您认为项目建设对当地经济发展带来什么影响？	促进作用	阻碍作用	没有影响 ✓	不知道
6. 您对当地环境质量现状是否满意？	非常满意 ✓	基本满意	不满意	不知道

7. 您认为当地最主要环境问题是？	水污染	大气污染	噪音环境	生态破坏	生活垃圾 ✓
8. 您认为新建学校/教师周转宿舍的最主要环境问题是？	水污染	大气污染	噪音环境 ✓	生态破坏	生活垃圾
9. 您认为新建学校/教师周转宿舍的环境问题主要出现在哪个阶段？	施工入场前 ✓	施工期 ✓	试运行期	运营期	
10. 您认为项目建设后对当地环境哪个方面产生影响最大？	水环境	大气环境	生态环境 ✓	噪声环境	
11. 您认为本项目的主要环境效益表现为那些方面？	减少污染	降低能耗	提高质量 ✓	/	
12. 本项目建设以后，您和当地居民的利益受到最大影响是？	收入提升	环境改善 ✓	就业增加	学识增广	
13. 为确保项目的成功实施，您认为下一步应该主要加强哪方面的工作？	宣传教育	培训	监测评价的组织实施	施工期监理 ✓	
14. 您对项目的建设及环境保护工作方面有何意见和建议？	施工时，希望减少对学生学习的影响，例如：噪音、安全、垃圾等。				
15. 项目实施和建设过程中有什么困难和希望？	可从环保设施、培训指导、资金补贴等方面提出。 没提到回收垃圾箱。进行垃圾分类。				

注：1、此表适用新建学校和教师周转宿舍

附表 1　世行贷款广东省欠发达地区义务教育均衡优质标准化发展示范项目
环境管理计划公众意见调查表（1）

姓名	性别	年龄	民族	文化程度
杨映竟	男	42	汉	初中
职务	职业	联系电话	住址（市 县 村）	
	务农		仁居中学	

利益相关者类别（请勾选）	项目办	校领导或管理人员	教师	学生家长	学生	村委居民	其他利益相关者
				√			

本项目建设重点是标准化课室，农村艰苦边远地区教师周转宿舍两大内容。该项目建设年限为5年（2016年10月-2021年12月）。标准化课室和农村艰苦边远地区教师周转宿舍涉及广东省16个县（市、区），其中标准化课室建筑面积为100m²/间，共投资建设250间标准课室；教师周转宿舍建筑面积按35 m²/套，共设置5200套。

标准化课室和周转宿舍两个子项目土建工程均在现有学校的校区内，该子项目主要的污染源集中在施工期，包括来自暴雨的地表径流、地下水、施工废水、生活污水，施工建筑材料的装卸、运输、储存过程及开挖弃土的堆砌、运输过程造成的扬尘，各类施工机械和运输车辆所排放的废气，机械噪声、施工作业噪声和施工车辆噪声，施工期间产生的地表开挖余泥、渣土弃土、施工剩余废物料等。运营期的污染源包括生活污水，生活垃圾。施工期应当严格界定泥土堆放的场地，建筑垃圾和生活垃圾应做好管理工作，并及时清运处理；通过临时排污管道和污水初级沉淀池处理设施及时处理后排放到下水道系统；严格控制施工机械设备的运行路线和操作规范，合理安排施工时间；及时清理剩余的淤泥渣土，减少扬尘的排放量等。运营期若城镇污水系统尚未建成或正在建设中，需加快市政管网和污水处理厂的建设，生活污水暂且采用地埋式一体化污水处理设备，达到国家污水排放标准后方可排放。生活垃圾由环卫部门收集后统一运至垃圾填埋场处理，设备均采用超低噪声型产品和减振措施。

1. 您是否了解本项目？	了解	听到过	不了解 √	/
2. 您是通过什么途径了解本项目信息的？	公告栏	电视/报纸/网络/座谈会	当地居民	其它 √
3. 您对该项目持何种态度？	赞同 √	不赞同	不知道	/
4. 您如何看待项目的选址问题？	合理 √	不合理	不知道 √	/
5. 您认为项目建设对当地经济发展带来什么影响？	促进作用 √	阻碍作用	没有影响	不知道
6. 您对当地环境质量现状是否满意？	非常满意	基本满意 √	不满意	不知道

7. 您认为当地最主要环境问题是？	水污染	大气污染	噪音环境	生态破坏	生活垃圾 ✓
8. 您认为新建学校/教师周转宿舍的最主要环境问题是？	水污染	大气污染	噪音环境	生态破坏	生活垃圾 ✓
9. 您认为新建学校/教师周转宿舍的环境问题主要出现在哪个阶段？	施工入场前	施工期	试运行期 ✓	运营期	
10. 您认为项目建设后对当地环境哪个方面产生影响最大？	水环境 ✓	大气环境	生态环境	噪声环境	
11. 您认为本项目的主要环境效益表现为那些方面？	减少污染	降低能耗	提高质量 ✓	/	
12. 本项目建设以后，您和当地居民的利益受到最大影响是？	收入提升	环境改善 ✓	就业增加	学识增广	
13. 为确保项目的成功实施，您认为下一步应该主要加强哪方面的工作？	宣传教育 ✓	培训	监测评价的组织实施	施工期监理	
14. 您对项目的建设及环境保护工作方面有何意见和建议？	在建设的同时希望能做好污水的排放，做到无污染				
15. 项目实施和建设过程中有什么困难和希望？	可从环保设施、培训指导、资金补贴等方面提出。 希望有加强的经济的投入，提高教师的工作环境，提高教学质量				

注：1、此表适用新建学校和教师周转宿舍

附表 2　世行贷款广东省欠发达地区义务教育均衡优质标准化发展示范项目
环境管理计划公众意见调查表（2）

姓名	性别	年龄	民族	文化程度
吴晔	男	45	汉	大专
职务	职业	联系电话	住址（　市　县　村）	
校长	教师	5720786	茂名市电白区望夫镇塘址村	

利益相关者类别	项目办	校领导或管理人员	教师	学生家长	学生	村委居民	其他利益相关者
		✓					

本项目建设重点是标准化流动实验室。标准化流动实验室涉及广东省 2 个县（市、区），标准化流动实验室的载体为大巴车，长 12m，宽 2.55m，高 3.95m，轴距 6.05m，车上不配乘客座位。设备包括试验台，地板，供水系统，供电系统，空调系统，通风系统，预警逃生系统，视频监控系统和废水回收系统。

标准化流动实验室仅购买流动实验室成套设备。本子项目的污染源包括正常使用期间产生的实验废水，少量汽车尾气废气，实验的遗弃用品。本项目产生的实验废水由提供购买流动实验室服务的公司运至附近污水处理厂进行处理，该污水处理厂必须有纳污能力和处理实验室废水的资质，并对实验室废水去向进行监控。实验室产生的实验遗弃的废品和试验材料，需按照教材明确来源，拟交由有处理资质的单位进行回收处理。

问题					
1. 您是否了解本项目？	了解 ✓	听到过		不了解	/
2. 您是通过什么途径了解本项目信息的？	公告栏	电视/报纸/网络/座谈会 ✓		当地居民	其它
3. 您对该项目持何种态度？	赞同 ✓	不赞同		不知道	/
4. 您如何看待项目的选址问题？	合理 ✓	不合理		不知道	/
5. 您认为本项目对当地经济发展带来什么影响？	促进作用 ✓	阻碍作用		没有影响	不知道
6. 您对当地环境质量现状是否满意？	非常满意 ✓	基本满意		不满意	不知道
7. 您认为当地最主要环境问题是？	水污染	大气污染	噪声环境	生态破坏	生活垃圾 ✓
8. 您认为标准化流动实验室的最主要环境问题是？	水环境 ✓	大气环境	固体废物环境	噪声环境	生态破坏

9. 您认为标准化流动实验室的环境问题主要出现在哪个阶段?	车子入场前	实验期间 ✓	实验后	车里离开后
10. 您认为本项目实施后的主要环境效益表现为那些方面?	减少污染 ✓	降低能耗	提高质量	/
11. 本项目实施以后,您和当地居民的利益受到最大影响是?	收入提升	环境改善	就业增加	学识增广 ✓
12. 为确保项目的成功实施,您认为下一步应该主要加强哪方面的工作?	宣传教育	培训 ✓	监测评价的组织实施	施工期监理
13. 您对项目的实施及环境保护工作方面有何意见和建议?	规范管理,重视环境保护			
14. 项目实施过程中有什么困难和希望?	可从环保设施、培训指导、资金补贴等方面提出。 环保设施设备要达标,要做好 教师的培训指导工作。			

注:此表适用于标准化流动实验室

Annex 1 Lufeng Wastewater Treatment Plant Water Quality Monitoring Data

2015 January	COD(mg/L)		Removal %	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%	Chromaticity		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Removal%		Total Influent	Total Effluent	Total Influent	Total Effluent		Total Influent	Total Effluent	
1	101.3	15.0	85.19	35.30	7.35	79.18	68	18	73.53	18.97	5.82	69.32	9.33	0.32	96.57	3.11	0.32	89.71	8.00	7.82						
2	96.7	11.1	88.52	36.72	9.12	75.16	64	16	75.00	16.76	6.42	61.69	12.03	0.52	95.68	2.90	0.45	84.48	7.97	7.73						
3	102.4	5.2	94.92	39.72	8.02	79.81	72	11	84.72	15.34	9.00	41.33	10.34	0.28	97.29	1.84	0.44	76.09	7.91	7.80						
4	97.4	3.6	96.30	35.95	7.80	78.30	60	15	75.00	16.02	7.53	53.00	8.45	0.33	96.09	1.97	0.38	80.71	7.82	7.69						
5	96.3	10.2	89.41	36.53	8.98	75.42	68	18	73.53	19.39	5.68	70.71	10.45	0.47	95.50	2.02	0.25	87.62	8.01	7.84	270000	1700	99.37			
6	94.0	19.4	79.36	40.38	9.43	76.65	68	12	82.35	16.79	6.17	63.25	8.99	0.32	96.44	2.66	0.35	86.84	8.09	8.00						
7	97.2	18.3	81.17	42.78	7.33	82.87	72	14	80.56	19.85	8.11	59.14	11.68	0.31	97.35	3.08	0.30	90.26	7.94	7.83						
8	88.2	13.6	84.58	32.55	7.30	77.57	60	17	71.67	18.87	6.24	66.93	8.10	0.21	97.41	2.75	0.23	91.64	7.92	7.82				61	22	63.93
9	96.1	15.3	84.08	34.59	8.84	74.44	64	14	78.13	17.22	5.47	68.23	9.85	0.46	95.33	2.16	0.22	89.81	8.00	7.82						
10	94.0	3.9	95.85	33.73	9.13	72.93	64	17	73.44	19.91	6.28	68.46	10.03	0.28	97.21	1.96	0.25	87.24	7.96	7.90						
11	90.2	8.6	90.47	37.93	7.43	80.41	72	18	75.00	15.74	7.90	49.81	9.33	0.30	96.78	2.82	0.27	90.43	7.96	7.89						
12	98.5	12.5	87.31	42.51	7.86	81.51	68	15	77.94	18.00	5.98	66.78	10.88	0.33	96.97	1.86	0.43	76.88	7.88	7.85						
13	89.6	9.2	89.73	33.96	7.51	77.89	60	12	80.00	19.87	7.55	62.00	11.38	0.27	97.63	2.00	0.31	84.50	8.00	7.91						
14	90.5	17.3	80.88	35.31	9.61	72.78	72	17	76.39	18.15	5.52	69.59	9.60	0.25	97.40	1.84	0.26	85.87	7.91	7.84				58	19	67.24
15	101.8	17.9	82.47	36.76	8.76	76.17	68	14	79.41	16.65	8.30	50.15	11.42	0.26	97.72	2.68	0.24	91.04	7.83	7.62	330000	1700	99.48			
16	92.0	12.5	86.41	33.20	8.40	74.70	60	11	81.67	19.93	5.71	71.35	10.63	0.40	96.24	3.07	0.43	85.99	7.99	7.80						
17	90.3	14.5	83.94	34.21	7.31	78.63	60	13	78.33	16.88	7.11	57.88	12.07	0.28	97.68	2.77	0.43	84.48	7.79	7.75						
18	101.4	14.0	86.19	35.78	9.28	74.06	72	14	80.56	19.14	6.41	66.51	8.78	0.22	97.49	2.95	0.42	85.76	8.01	7.86						
19	90.7	30.0	66.92	32.55	8.30	74.50	68	16	76.47	18.55	7.92	57.30	11.08	0.17	98.47	1.93	0.31	83.94	7.85	7.70						
20	102.4	16.7	83.69	40.97	9.02	77.98	72	15	79.17	19.00	6.10	67.89	8.84	0.17	98.08	3.00	0.35	88.33	8.03	8.00						
21	99.2	24.3	75.50	44.50	7.50	83.15	60	13	78.33	16.68	8.63	48.26	9.91	0.21	97.88	2.85	0.23	91.93	8.01	7.95				58	21	63.79
22	100.3	20.4	79.66	36.21	7.56	79.12	60	14	76.67	18.94	7.26	61.67	10.95	0.36	96.71	2.47	0.39	84.21	7.99	7.97	230000	1400	99.39			
23	100.1	19.1	80.92	45.13	9.58	78.77	60	13	78.33	19.85	9.00	54.66	11.25	0.30	97.33	3.26	0.41	87.42	8.12	8.00						
24	100.3	16.5	83.55	44.20	8.40	81.00	72	15	79.17	15.63	6.08	61.10	8.96	0.39	95.65	2.81	0.25	91.10	7.97	7.92						
25	99.8	13.9	86.07	35.74	8.09	77.36	60	12	80.00	17.67	5.35	69.72	9.57	0.41	95.72	1.78	0.24	86.52	8.11	7.94						
26	96.7	10.7	88.93	42.44	7.59	82.12	64	11	82.81	18.33	6.61	63.94	10.24	0.35	96.58	2.11	0.41	80.57	8.13	7.99				60	20	66.67
27	100.2	19.2	80.84	37.93	8.63	77.25	60	16	73.33	19.21	5.92	69.18	9.75	0.29	97.03	2.67	0.39	85.39	8.00	8.02						
28	87.9	14.4	83.62	32.57	9.07	72.15	56	14	75.00	17.01	8.14	52.15	10.76	0.24	97.77	1.94	0.25	87.11	7.96	7.93						
29	93.7	7.4	92.10	38.62	7.02	81.82	64	12	81.25	18.10	7.22	60.11	11.81	0.30	97.46	3.04	0.31	89.80	8.10	8.06	270000	2100	99.22			
30	100.4	5.1	94.92	44.95	8.45	81.20	72	19	73.61	19.00	5.89	69.00	9.48	0.40	95.78	2.63	0.37	85.93	8.07	8.11						
31	88.6	13.8	84.42	38.18	7.98	79.10	60	15	75.00	15.64	8.08	48.34	8.63	0.38	95.60	3.03	0.45	85.15	7.86	7.93						
Average	96.1	14.0	85.42	37.80	8.28	77.87	65	15	77.62	17.97	6.88	61.27	10.15	0.32	96.87	2.51	0.33	86.35	7.97	7.88	275000	1725	99.37	59	21	65.41

2015 February	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%	Chromaticity		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent		Total Influent	Total Effluent	
1	90.2	6.4	92.90	32.37	6.72	79.24	68	9	86.76	18.09	6.80	62.41	13.54	0.32	97.64	2.28	0.27	88.16	8.11	8.00						
2	88.8	10.9	87.73	38.16	6.11	83.99	52	11	78.85	15.09	5.75	61.90	10.65	0.29	97.28	2.70	0.23	91.48	8.00	7.92	230000	1700	99.26			
3	79.8	5.2	93.48	34.34	5.79	83.14	48	12	75.00	14.71	7.00	52.41	12.57	0.25	98.01	3.01	0.34	88.70	7.96	7.89						
4	82.2	6.7	91.85	35.33	7.03	80.10	52	10	80.77	17.67	6.61	62.59	11.56	0.30	97.40	2.52	0.32	87.30	7.75	7.65						
5	89.3	10.3	88.47	33.03	5.88	82.20	56	11	80.36	18.23	5.77	68.35	11.84	0.42	96.45	2.08	0.28	86.54	8.00	7.89						
6	87.0	7.6	91.26	33.10	7.80	76.44	68	8	88.24	18.75	7.15	61.87	10.47	0.34	96.75	1.96	0.19	90.31	8.03	7.90				62	20	67.74
7	91.3	12.5	86.31	32.79	5.89	82.04	52	9	82.69	14.56	4.62	68.27	13.52	0.51	96.23	2.25	0.35	84.44	7.90	7.76						
8	89.2	6.7	92.49	33.91	7.26	78.59	68	10	85.29	16.26	6.24	61.62	11.97	0.32	97.33	1.45	0.24	83.45	8.07	8.00						
9	83.4	8.5	89.81	29.30	5.60	80.89	48	14	70.83	18.63	5.07	72.79	12.29	0.25	97.97	1.16	0.36	68.97	8.11	8.06						
10	78.9	20.5	74.02	32.33	7.68	76.24	68	10	85.29	16.37	5.62	65.67	11.57	0.20	98.27	3.11	0.28	91.00	7.86	7.79						
11	82.4	13.5	83.62	30.61	5.76	81.18	64	9	85.94	15.68	4.68	70.15	13.08	0.39	97.02	2.56	0.32	87.50	7.94	7.81	210000	900	99.57			
12	90.4	30.4	66.37	40.72	7.67	81.16	60	11	81.67	18.32	5.83	68.18	10.44	2.11	79.79	1.64	0.29	82.32	7.91	7.63						
13	81.4	28.2	65.36	32.51	5.56	82.90	60	12	80.00	15.34	7.05	54.04	11.18	2.90	74.06	2.12	0.27	87.26	7.52	7.38				56	18	67.86
14	84.8	30.6	63.92	35.53	6.93	80.50	48	11	77.08	17.70	5.34	69.83	12.11	2.00	83.48	2.29	0.19	91.70	7.46	7.30						
15	78.4	24.9	68.24	30.64	7.14	76.70	60	13	78.33	16.18	5.67	64.96	10.63	0.43	95.95	1.74	0.25	85.63	7.68	7.40						
16	86.1	19.0	77.93	38.79	6.34	83.66	52	8	84.62	18.35	6.55	64.31	12.97	0.30	97.69	2.36	0.36	84.75	7.63	7.41						
17	75.6	26.1	65.48	27.92	5.67	79.69	60	10	83.33	15.14	4.78	68.43	10.43	0.53	94.92	2.97	0.27	90.91	7.46	7.23						
18	90.7	29.0	68.03	37.14	5.99	83.87	52	13	75.00	18.45	6.38	65.42	11.24	0.35	96.89	3.07	0.19	93.81	7.81	7.46	210000	1100	99.48			
19	78.1	22.5	71.19	28.15	5.35	80.99	48	9	81.25	16.80	6.62	60.60	13.30	0.24	98.20	2.75	0.25	90.91	7.94	7.50						
20	78.1	30.2	61.33	30.42	7.12	76.59	52	12	76.92	17.42	5.01	71.24	11.55	0.47	95.93	1.86	0.30	83.87	7.42	7.29						
21	88.9	24.0	73.00	37.38	6.03	83.87	56	10	82.14	15.15	5.69	62.44	11.30	0.36	96.81	2.05	0.36	82.44	7.51	7.27						
22	90.3	19.2	78.74	36.18	7.33	79.74	64	9	85.94	16.97	6.73	60.34	12.02	0.36	97.00	2.76	0.27	90.22	7.63	7.29						
23	85.7	20.6	75.96	35.12	5.47	84.42	56	13	76.79	18.75	4.43	76.37	11.62	0.29	97.50	3.00	0.24	92.00	7.82	7.30						
24	90.7	23.5	74.09	37.22	6.17	83.42	48	12	75.00	16.49	6.92	58.04	12.06	0.31	97.43	2.85	0.19	93.33	7.47	7.26						
25	82.7	18.5	77.63	34.78	6.93	80.07	56	10	82.14	15.35	7.38	51.92	11.55	0.33	97.14	1.99	0.23	88.44	7.36	7.20				58	19	67.24
26	83.1	20.6	75.21	32.35	7.50	76.82	64	12	81.25	17.65	6.84	61.25	13.05	0.28	97.85	2.96	0.30	89.86	7.74	7.41	230000	1100	99.52			
27	86.2	17.4	79.81	32.79	5.59	82.95	48	9	81.25	14.82	5.57	62.42	12.21	0.46	96.23	1.81	0.24	86.74	7.91	7.53						
28	92.5	20.1	78.27	32.44	7.39	77.22	52	11	78.85	16.37	7.01	57.18	10.75	0.33	96.93	2.26	0.21	90.71	7.53	7.31						
Average	85.2	18.3	78.30	33.76	6.49	80.67	56	11	81	16.76	6.04	63.75	11.84	0.56	95.15	2.34	0.27	87.60	7.77	7.57	220000	1200	99.46	59	19	67.61

2015 March	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%	Chromaticity		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent		Total Influent	Total Effluent	
1	91.9	23.1	74.86	34.12	5.62	83.53	60	15	75.00	13.92	7.05	49.35	12.52	0.36	97.12	3.58	0.43	87.99	7.55	7.32						
2	88.6	22.8	74.27	37.16	5.16	86.11	56	10	82.14	17.11	4.34	74.63	9.68	0.30	96.90	4.25	0.39	90.82	7.49	7.28				56	17	69.64
3	99.2	16.4	83.47	35.74	6.79	81.00	56	12	78.57	13.97	6.24	55.33	11.52	0.41	96.44	5.00	0.48	90.40	7.72	7.50						
4	100.9	16.9	83.25	39.21	5.46	86.07	48	9	81.25	14.15	5.51	61.06	12.15	0.42	96.54	4.49	0.30	93.32	7.88	7.72	260000	1100	99.58			
5	96.0	20.4	78.75	39.38	7.08	82.02	56	14	75.00	13.95	7.11	49.03	11.37	0.36	96.83	3.96	0.48	87.88	7.70	7.61						
6	82.1	19.4	76.37	30.34	5.34	82.40	52	10	80.77	15.63	6.62	57.65	9.63	0.40	95.85	4.22	0.45	89.34	7.56	7.30						
7	97.3	18.6	80.88	34.12	7.87	76.93	44	10	77.27	14.38	4.74	67.04	11.88	0.29	97.56	5.11	0.47	90.80	7.41	7.29						
8	92.1	17.2	81.32	35.95	7.50	79.14	52	15	71.15	13.88	6.92	50.14	10.08	0.25	97.52	3.74	0.53	85.83	7.56	7.30						
9	91.4	16.4	82.06	31.99	7.14	77.68	48	13	72.92	16.42	5.58	66.02	12.26	0.32	97.39	3.40	0.23	93.24	7.44	7.21						
10	88.3	10.3	88.34	38.00	7.05	81.45	60	11	81.67	14.39	4.63	67.82	9.42	0.47	95.01	4.97	0.45	90.95	7.53	7.20						
11	99.6	16.9	83.03	40.81	7.86	80.74	52	16	69.23	13.72	6.01	56.20	12.27	0.39	96.82	5.07	0.28	94.48	7.49	7.17				54	17	68.52
12	84.7	17.2	79.69	32.92	5.32	83.84	52	10	80.77	14.52	5.87	59.57	11.50	0.35	96.96	4.60	0.49	89.35	7.77	7.31	220000	900	99.59			
13	82.9	18.5	77.68	32.39	6.04	81.35	44	11	75.00	15.36	6.72	56.25	10.81	0.29	97.32	2.99	0.23	92.31	7.46	7.27						
14	94.4	7.2	92.37	39.63	6.73	83.02	64	13	79.69	13.49	6.01	55.45	11.48	0.33	97.13	3.03	0.40	86.80	7.56	7.25						
15	83.4	9.0	89.21	31.76	7.31	76.98	48	15	68.75	17.05	5.87	65.57	9.45	0.41	95.66	4.21	0.30	92.87	7.58	7.30						
16	95.9	14.5	84.88	42.16	5.61	86.69	56	11	80.36	14.40	4.64	67.78	12.42	0.35	97.18	5.24	0.28	94.66	7.36	7.18						
17	83.5	12.8	84.67	36.00	7.90	78.06	44	10	77.27	13.51	7.08	47.59	10.60	0.28	97.36	3.47	0.30	91.35	7.48	7.22						
18	98.1	10.6	89.19	35.33	6.88	80.53	44	11	75.00	17.36	4.24	75.58	9.63	0.36	96.26	4.40	0.46	89.55	7.36	7.19						
19	102.6	7.2	92.98	45.14	6.39	85.84	60	12	80.00	14.11	5.06	64.14	12.21	0.43	96.48	2.69	0.45	83.27	7.41	7.10						
20	84.9	8.7	89.75	35.75	7.05	80.28	44	10	77.27	13.61	6.62	51.36	9.85	0.52	94.72	3.78	0.23	93.92	7.91	7.50	270000	1300	99.52			
21	88.5	9.1	89.72	30.93	6.93	77.59	44	9	79.55	15.27	7.00	54.16	10.92	0.38	96.52	4.66	0.46	90.13	7.46	7.22						
22	90.4	8.7	90.38	39.81	6.76	83.02	44	13	70.45	14.22	4.97	65.05	11.62	0.36	96.90	3.08	0.50	83.77	7.34	7.11						
23	95.2	11.5	87.92	38.19	7.84	79.47	64	11	82.81	13.74	5.39	60.77	9.90	0.31	96.87	4.27	0.38	91.10	7.58	7.35				57	18	68.42
24	89.7	15.8	82.39	40.31	7.86	80.50	56	13	76.79	14.69	6.03	58.95	12.02	0.34	97.17	3.55	0.53	85.07	7.84	7.59						
25	83.3	20.3	75.63	35.93	5.28	85.30	48	11	77.08	17.11	4.65	72.82	10.76	0.35	96.75	5.01	0.44	91.22	7.96	7.63						
26	95.3	17.3	81.85	36.22	6.22	82.83	60	12	80.00	14.55	5.47	62.41	9.65	0.28	97.10	3.05	0.34	88.85	7.87	7.56						
27	104.4	24.8	76.25	41.78	6.48	84.49	56	14	75.00	15.51	7.03	54.67	11.63	0.49	95.79	2.69	0.41	84.76	7.82	7.65						
28	99.0	16.1	83.74	42.63	6.33	85.15	64	10	84.38	13.70	4.86	64.53	10.06	0.37	96.32	4.88	0.27	94.47	7.86	7.62						
29	84.9	21.1	75.15	33.83	5.43	83.95	60	15	75.00	14.70	6.42	56.33	12.68	0.40	96.85	3.98	0.38	90.45	7.87	7.70						
30	90.6	15.3	83.11	33.38	6.53	80.44	44	11	75.00	13.92	4.33	68.89	9.75	0.33	96.62	5.11	0.42	91.78	8.00	7.83	270000	2100	99.22			
31	94.5	12.7	86.56	35.96	5.11	85.79	56	13	76.79	16.09	5.55	65.51	11.23	0.41	96.35	3.46	0.32	90.75	7.76	7.55				60	20	66.67
Average	92.1	15.4	83.22	36.67	6.54	82.01	53	12	77.16	14.79	5.76	60.70	11.00	0.36	96.65	4.06	0.39	90.05	7.63	7.39	255000	1350	99.48	57	18	68.86

2015 April	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%	Chromaticity		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent		Total Influent	Total Effluent	
1	86.7	20.1	76.82	31.30	7.50	76.04	48	13	72.92	17.71	6.68	62.28	13.33	0.32	97.60	5.15	0.24	95.34	7.52	7.40						
2	82.4	15.4	81.31	35.38	7.98	77.44	60	15	75.00	18.27	7.34	59.82	10.49	0.29	97.24	4.38	0.33	92.47	7.61	7.49	230000	1700	99.26			
3	91.9	20.3	77.91	35.10	6.90	80.34	56	12	78.57	19.30	5.55	71.24	12.88	0.49	96.20	3.25	0.40	87.69	7.78	7.58						
4	93.8	16.2	82.73	35.64	7.09	80.11	48	13	72.92	17.66	7.12	59.68	10.26	0.25	97.56	5.02	0.33	93.43	7.82	7.68						
5	88.8	27.2	69.37	34.59	8.49	75.46	52	16	69.23	18.32	8.00	56.33	11.17	0.29	97.40	3.17	0.23	92.74	7.93	7.71						
6	84.9	16.8	80.21	33.92	7.07	79.16	64	15	76.56	17.97	6.01	66.56	13.41	0.30	97.76	5.45	0.27	95.05	7.85	7.75						
7	91.7	14.7	83.97	36.72	7.87	78.57	52	18	65.38	16.62	5.95	64.20	12.48	0.33	97.36	3.68	0.29	92.12	7.93	7.68				55	17	69.09
8	84.7	22.5	73.44	31.36	6.81	78.28	60	16	73.33	18.37	8.03	56.29	10.54	0.29	97.25	4.06	0.37	90.89	7.74	7.58						
9	87.7	17.3	80.27	34.12	7.67	77.52	52	14	73.08	16.85	6.72	60.12	11.99	0.24	98.00	4.18	0.31	92.58	7.86	7.62						
10	93.7	21.3	77.27	39.37	8.27	78.99	52	16	69.23	18.95	5.72	69.82	12.63	0.42	96.67	5.24	0.24	95.42	7.93	7.61	260000	2100	99.19			
11	78.4	23.6	69.90	33.74	7.94	76.47	48	12	75.00	16.70	7.08	57.60	13.39	0.30	97.76	4.71	0.28	94.06	7.86	7.64						
12	84.5	28.8	65.92	35.54	6.69	81.18	56	17	69.64	18.82	8.56	54.52	10.65	0.31	97.09	3.15	0.30	90.48	8.00	7.80						
13	90.4	30.0	66.81	33.41	9.01	73.03	64	15	76.56	16.52	7.15	56.72	11.76	0.35	97.02	5.01	0.41	91.82	8.03	7.82						
14	81.1	23.5	71.02	29.24	6.54	77.63	56	12	78.57	15.23	6.04	60.34	12.18	0.25	97.95	3.91	0.34	91.30	7.98	7.79						
15	80.9	14.4	82.20	36.40	7.35	79.81	60	16	73.33	17.86	6.81	61.87	10.49	0.36	96.57	5.32	0.38	92.86	7.93	7.75				60	20	100.00
16	78.9	12.7	83.90	29.83	6.13	79.45	48	13	72.92	18.48	7.14	61.36	13.17	0.34	97.42	4.67	0.34	92.72	8.03	7.81						
17	85.4	17.6	79.39	30.81	8.21	73.35	60	15	75.00	16.36	5.91	63.88	11.47	0.48	95.82	3.17	0.27	91.48	7.91	7.76						
18	92.9	12.5	86.54	39.00	9.05	76.79	52	14	73.08	15.34	8.47	44.78	13.55	0.32	97.64	5.06	0.38	92.49	7.99	7.75						
19	89.3	24.5	72.56	34.79	6.64	80.91	48	17	64.58	18.07	6.86	62.04	12.19	0.29	97.62	3.49	0.24	93.12	8.11	7.82						
20	83.3	15.5	81.39	34.16	7.21	78.89	52	15	71.15	17.92	7.92	55.80	12.20	0.27	97.79	4.78	0.31	93.51	7.86	7.72						
21	90.3	10.6	88.26	39.75	8.95	77.48	60	16	73.33	18.86	8.36	55.67	10.80	0.29	97.31	5.31	0.27	94.92	7.93	7.72	230000	2200	99.04			
22	88.0	8.4	90.45	32.70	7.95	75.69	60	13	78.33	20.31	5.92	70.85	11.56	0.26	97.75	5.16	0.38	92.64	7.97	7.75						
23	79.8	18.3	77.07	34.33	6.98	79.67	60	15	75.00	15.85	7.87	50.35	12.68	0.30	97.63	4.38	0.36	91.78	7.85	7.61				57	20	64.91
24	86.2	10.4	87.94	31.90	8.75	72.57	48	16	66.67	17.46	6.29	63.97	13.01	0.50	96.16	3.42	0.25	92.69	7.79	7.54						
25	91.9	8.4	90.86	38.61	6.31	83.66	48	14	70.83	20.39	7.11	65.13	10.78	0.26	97.59	4.66	0.40	91.42	7.90	7.76						
26	84.6	11.4	86.52	31.30	7.35	76.52	56	12	78.57	15.29	6.09	60.17	12.36	0.23	98.14	3.98	0.35	91.21	7.95	7.73						
27	78.6	18.1	76.97	34.61	9.11	73.68	64	15	76.56	17.55	8.29	52.76	11.39	0.24	97.89	4.00	0.26	93.50	7.79	7.77						
28	88.3	26.2	70.33	31.64	6.94	78.07	56	14	75.00	16.39	7.41	54.79	10.78	0.34	96.85	5.19	0.28	94.61	7.76	7.50						
29	90.2	14.5	83.92	33.33	7.98	76.06	60	15	75.00	19.37	6.75	65.15	13.33	0.32	97.60	4.73	0.31	93.45	7.54	7.32						
30	80.9	23.9	70.46	32.24	7.04	78.16	48	17	64.58	16.13	8.11	49.72	12.09	0.24	98.01	3.87	0.26	93.28	7.68	7.31	230000	1700	99.26			
Average	86.3	18.2	78.86	34.16	7.59	77.70	55	15	73.00	17.63	7.04	59.79	11.97	0.32	97.35	4.39	0.31	92.70	7.86	7.66	237500	1925	99.19	57	19	78.00

2015 May	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%	Chromaticity		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent		Total Influent	Total Effluent	
1	86.7	20.1	76.82	31.34	7.84	74.98	68	11	83.82	20.35	7.78	61.77	12.94	0.38	97.06	6.00	0.39	93.50	7.71	7.42						
2	91.0	11.8	87.03	39.15	9.30	76.25	52	12	76.92	18.07	9.02	50.08	14.07	0.35	97.51	4.22	0.52	87.68	7.82	7.71						
3	97.2	18.4	81.07	38.95	10.50	73.04	52	15	71.15	17.41	7.33	57.90	13.40	0.37	97.24	5.50	0.40	92.73	7.91	7.62						
4	87.3	8.9	89.81	31.34	7.89	74.82	76	15	80.26	22.65	8.88	60.79	14.07	0.25	98.22	4.87	0.57	88.30	7.45	7.35				62	22	64.52
5	101.2	14.0	86.17	37.62	9.52	74.69	52	11	78.85	19.18	7.19	62.51	13.14	0.19	98.55	6.12	0.42	93.14	7.72	7.42						
6	99.9	20.1	79.88	36.01	9.46	73.73	72	15	79.17	20.57	6.82	66.84	11.48	0.26	97.74	3.91	0.57	85.42	7.63	7.11	330000	2600	99.21			
7	88.9	11.7	86.84	35.52	10.02	71.79	64	14	78.13	17.86	8.85	50.45	11.92	0.20	98.32	5.41	0.60	88.91	7.45	7.15						
8	97.4	18.1	81.42	37.13	7.63	79.45	56	12	78.57	19.56	9.12	53.37	12.11	0.35	97.11	6.19	0.42	93.21	7.28	7.08						
9	87.4	28.3	67.62	36.59	8.19	77.62	76	14	81.58	17.54	7.34	58.15	10.99	0.49	95.54	4.20	0.59	85.95	7.35	7.02						
10	93.3	20.5	78.03	37.33	9.48	74.60	68	13	80.88	19.65	5.96	69.67	12.66	0.35	97.24	5.05	0.40	92.08	7.29	7.08						
11	91.7	15.7	82.88	32.93	9.18	72.12	56	10	82.14	22.59	8.82	60.96	13.80	0.40	97.10	6.19	0.38	93.86	7.48	7.18						
12	84.6	12.0	85.82	38.01	7.41	80.51	76	14	81.58	19.99	7.58	62.08	11.29	0.34	96.99	3.95	0.46	88.35	7.46	7.13						
13	89.9	15.0	83.31	39.42	8.92	77.37	76	15	80.26	22.70	6.94	69.43	13.08	0.21	98.39	5.93	0.59	90.05	7.58	7.22				58	21	63.79
14	92.4	18.9	79.55	36.11	10.51	70.89	56	12	78.57	17.33	8.55	50.66	11.16	0.46	95.88	3.91	0.35	91.05	7.71	7.23	270000	2200	99.19			
15	83.3	11.8	85.83	33.21	10.26	69.11	52	13	75.00	21.10	6.26	70.33	13.10	0.36	97.25	4.85	0.45	90.72	7.64	7.19						
16	102.6	20.0	80.51	43.15	7.55	82.50	72	10	86.11	18.56	9.00	51.51	12.86	0.26	97.98	5.22	0.57	89.08	7.76	7.20						
17	84.6	22.0	74.00	33.79	9.74	71.17	72	14	80.56	20.01	6.30	68.52	14.01	0.32	97.72	4.11	0.41	90.02	7.65	7.22						
18	95.6	10.2	89.33	36.36	8.66	76.18	60	10	83.33	17.78	7.85	55.85	12.44	0.42	96.62	5.57	0.34	93.90	7.48	7.17						
19	100.0	14.9	85.10	42.91	9.56	77.72	60	14	76.67	22.02	6.54	70.30	11.11	0.39	96.49	5.68	0.41	92.78	7.68	7.26						
20	94.3	16.8	82.18	36.71	8.81	76.00	68	16	76.47	21.79	7.84	64.02	14.11	0.24	98.30	4.16	0.51	87.74	7.29	7.00						
21	102.2	14.0	86.30	38.93	10.18	73.85	56	13	76.79	20.66	8.49	58.91	12.38	0.40	96.77	3.98	0.44	88.94	7.36	6.86				56	21	62.50
22	89.6	27.5	69.31	31.37	7.72	75.39	64	16	75.00	21.40	6.22	70.93	11.00	0.57	94.82	5.53	0.54	90.24	7.24	6.92	330000	2100	99.36			
23	94.0	28.5	69.68	42.35	7.60	82.05	64	11	82.81	21.45	7.69	64.15	10.97	0.43	96.08	6.11	0.59	90.34	7.31	7.01						
24	89.2	26.2	70.63	34.72	8.02	76.90	68	12	82.35	19.86	6.03	69.64	13.23	0.46	96.52	4.36	0.39	91.06	7.18	6.98						
25	96.6	19.2	80.12	41.43	7.73	81.34	76	15	80.26	18.04	8.11	55.04	12.50	0.48	96.16	5.33	0.57	89.31	7.37	7.05						
26	97.4	16.5	83.06	39.98	7.28	81.79	68	14	79.41	17.61	7.83	55.54	14.32	0.33	97.70	3.54	0.44	87.57	7.40	7.11						
27	89.6	22.1	75.33	34.20	10.20	70.18	64	13	79.69	18.40	9.03	50.92	13.67	0.37	97.29	4.01	0.42	89.53	7.21	7.03						
28	91.7	28.0	69.47	35.81	8.11	77.35	64	10	84.38	22.66	5.99	73.57	11.77	0.61	94.82	3.83	0.48	87.47	7.14	7.00	260000	2100	99.19			
29	95.9	27.4	71.43	35.42	9.22	73.97	60	12	80.00	20.13	8.44	58.07	12.20	0.42	96.56	4.76	0.58	87.82	7.44	7.20						
30	88.3	16.3	81.54	38.82	7.72	80.11	68	11	83.82	19.55	6.51	66.70	10.99	0.28	97.45	6.11	0.36	94.11	7.41	7.22						
31	96.3	14.5	84.94	34.77	8.02	76.93	64	14	78.13	19.45	7.12	63.39	13.20	0.40	96.97	5.73	0.50	91.27	7.33	7.14						
Average	92.9	18.4	80.16	36.82	8.78	75.95	65	13	79.76	19.87	7.59	61.36	12.58	0.37	97.04	4.98	0.47	90.20	7.48	7.17	297500	2250	99.24	59	21	63.60

2015 June	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	86.1	20.3	76.42				60	17	71.67				11.02	0.32	97.10	5.73	0.55	90.40	7.65	6.93			
2	90.6	18.4	79.69				60	15	75.00	18.73	5.81	68.98	12.77	0.40	96.87				7.47	7.11	360000	3300	99.08
3	86.5	10.4	87.98	35.51	5.76	83.78	48	13	72.92				9.86	0.45	95.44				7.70	7.12			
4	88.8	12.7	85.70				72	14	80.56				12.67	0.42	96.69				7.42	7.19			
5	92.2	10.8	88.29				48	18	62.50				10.84	0.71	93.45				7.54	6.96			
6	100.4	8.3	91.73				64	14	78.13				9.18	0.43	95.32				7.61	7.02			
7	94.2	10.7	88.64				56	15	73.21				12.94	0.80	93.82				7.62	7.11			
8	89.1	12.3	86.20				72	13	81.94				10.43	0.50	95.21				7.72	6.91			
9	86.9	12.8	85.27				56	15	73.21				11.53	0.20	98.27				7.52	7.12			
10	82.5	10.9	86.79	34.60	7.55	78.18	60	13	78.33				9.65	0.17	98.24	4.30	0.43	90.00	7.46	7.13			
11	90.7	13.2	85.45				64	16	75.00	20.86	5.36	74.30	10.34	0.32	96.91				7.60	7.28	340000	2600	99.24
12	85.9	12.9	84.98				44	13	70.45				12.08	0.44	96.36				7.69	7.18			
13	83.9	10.8	87.13				60	14	76.67				11.06	0.68	93.85				7.59	7.06			
14	80.9	11.2	86.16				48	15	68.75				12.36	0.29	97.65				7.56	7.03			
15	90.6	10.7	88.19				68	18	73.53				13.14	0.31	97.64				7.47	6.91			
16	88.3	9.0	89.81				60	13	78.33				9.99	0.29	97.10				7.50	6.87			
17	93.8	11.2	88.06				64	17	73.44				10.80	0.41	96.20				7.44	6.95			
18	85.2	10.0	88.26	37.38	8.38	77.58	48	16	66.67				11.48	0.24	97.91				7.41	6.96			
19	87.4	8.7	90.05				52	14	73.08	22.54	7.11	68.46	12.73	0.39	96.94				7.51	7.29	430000	3400	99.21
20	90.5	12.8	85.86				64	13	79.69				9.46	0.25	97.36				7.69	7.32			
21	95.0	12.9	86.42				52	15	71.15				10.82	0.30	97.23				7.73	7.06			
22	89.7	10.7	88.07				64	17	73.44				11.82	0.23	98.05				7.73	6.99			
23	84.4	13.2	84.36				72	18	75.00				10.45	0.22	97.89	5.27	0.62	88.24	7.49	7.24			
24	90.6	14.1	84.44	37.91	9.01	76.23	56	14	75.00	18.54	5.19	72.01	12.11	0.28	97.69				7.62	7.13			
25	89.1	12.8	85.63				64	12	81.25				10.27	0.32	96.88				7.46	7.25	330000	2600	99.21
26	80.9	20.0	75.28				48	15	68.75				9.26	0.41	95.57				7.61	7.10			
27	86.1	14.6	83.04				56	16	71.43				11.06	0.34	96.93				7.53	6.86			
28	92.2	12.3	86.66				64	15	76.56				10.42	0.29	97.22				7.60	7.33			
29	100.3	14.9	85.14				72	13	81.94				12.05	0.22	98.17				7.72	7.29			
30	95.3	15.3	83.95				60	17	71.67	18.63	5.57	70.10	9.67	0.44	95.45	7.02	0.62	91.17	7.50	6.95			
Average	89.3	12.6	85.79	36.35	7.68	78.94	59	15	74.31	19.86	5.81	70.77	11.08	0.37	96.65	5.58	0.56	89.95	7.57	7.09	365000	2975	99.19

2015 July	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	94.3	10.3	89.08	38.70	5.12	86.77	56	9	83.93				13.47	0.34	97.48				7.43	7.02			
2	100.4	15.3	84.76				56	10	82.14				11.63	0.29	97.51				7.56	6.96	330000	2600	99.21
3	97.0	10.0	89.69				76	13	82.89	19.49	10.25	47.41	10.50	0.22	97.90	4.86	0.39	91.98	7.41	7.08			
4	101.5	19.7	80.59				68	15	77.94				8.82	0.30	96.60				7.43	6.89			
5	107.2	15.4	85.63				60	10	83.33				11.62	0.27	97.68				7.55	7.00			
6	93.7	16.8	82.07				64	15	76.56				9.55	0.23	97.59				7.47	6.90			
7	94.2	9.9	89.49				76	10	86.84				12.07	0.42	96.52				7.39	7.16			
8	101.3	16.7	83.51	42.59	7.05	83.45	68	13	80.88				10.15	0.29	97.14				7.45	7.06			
9	96.8	20.3	79.03				72	10	86.11				9.23	0.29	96.86				7.50	6.99			
10	107.2	16.0	85.07				72	11	84.72	21.36	8.54	60.02	10.00	0.33	96.70	6.11	0.42	93.13	7.46	7.18			
11	92.3	17.5	81.04				64	9	85.94				11.96	0.92	92.31				7.52	7.17			
12	90.6	14.6	83.89				56	14	75.00				10.77	0.29	97.31				7.39	7.14			
13	81.8	16.9	79.34				72	12	83.33				8.19	0.39	95.24				7.51	6.96	430000	3300	99.23
14	89.5	15.6	82.57				72	11	84.72				13.32	0.41	96.92				7.47	7.03			
15	105.6	18.4	82.58				68	14	79.41				10.68	0.20	98.13				7.36	7.04			
16	94.6	14.4	84.78	36.89	6.63	82.03	64	12	81.25				11.83	0.14	98.82				7.51	6.92			
17	103.6	11.3	89.09				72	11	84.72				13.13	0.28	97.87				7.39	7.13			
18	99.6	15.7	84.24				76	9	88.16				10.36	0.26	97.49				7.44	7.12			
19	95.6	19.2	79.92				64	11	82.81				12.15	0.30	97.53				7.58	7.08			
20	104.8	21.4	79.58				76	12	84.21	20.49	8.86	56.76	13.23	0.32	97.58	6.37	0.37	94.19	7.43	7.03	370000	2700	99.27
21	106.8	18.1	83.05				64	13	79.69				9.96	0.51	94.88				7.50	6.93			
22	103.5	23.4	77.39				64	12	81.25				11.28	0.44	96.10				7.48	7.02			
23	96.4	20.7	78.53	41.54	5.59	86.54	72	9	87.50				10.41	0.31	97.02				7.44	6.92			
24	103.9	13.2	87.30				64	13	79.69				13.19	0.28	97.88				7.39	7.01			
25	98.6	16.5	83.27				60	9	85.00				8.97	0.46	94.87				7.56	6.89			
26	105.9	17.3	83.66				76	15	80.26				12.17	0.35	97.12				7.40	7.02			
27	101.3	14.8	85.39				60	12	80.00				10.61	0.40	96.23				7.47	7.05			
28	95.5	13.5	85.86				72	11	84.72				11.19	0.44	96.07				7.45	7.15			
29	105.3	11.8	88.79				64	13	79.69	18.75	11.02	41.23	9.15	0.27	97.05	5.46	0.51	90.66	7.40	7.00			
30	96.6	12.1	87.47				72	12	83.33				10.19	0.24	97.64				7.38	7.16	330000	2700	99.18
31	100.2	17.2	82.83				76	9	88.16				11.65	0.20	98.28				7.59	7.11			
Average	98.9	15.9	83.85	39.93	6.10	84.70	76	12	82.54	20.02	9.67	51.35	11.01	0.34	96.87	5.70	0.42	92.49	7.46	7.04	365000	2825	99.22

2015 August	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	112.1	13.0	88.40				72	10	86.11				9.95	0.42	95.78				7.50	7.24			
2	104.9	10.7	89.80				70	12	82.86				10.12	0.24	97.63				7.37	7.25			
3	115.4	11.4	90.12				62	15	75.81				9.45	0.22	97.67				7.36	7.11			
4	101.7	16.9	83.38				56	11	80.36	20.17	9.11	54.83	12.04	0.31	97.43	5.62	0.41	92.70	7.54	7.22			
5	109.5	15.2	86.12				63	13	79.37				9.96	0.33	96.69				7.55	7.41			
6	93.4	14.6	84.37	36.47	6.12	83.22	77	10	87.01				10.34	0.30	97.10				7.38	7.37			
7	90.7	15.0	83.46				58	13	77.59				9.51	0.20	97.90				7.36	7.25	380000	2700	99.29
8	91.7	18.3	80.04				60	10	83.33				10.36	0.25	97.59				7.42	7.41			
9	100.7	19.3	80.83				64	12	81.25				12.12	0.23	98.10				7.39	7.09			
10	96.5	16.1	83.32				80	11	86.25				11.53	0.26	97.75				7.45	7.07			
11	103.3	13.2	87.22				67	12	82.09				10.02	0.44	95.61				7.50	7.39			
12	100.9	15.7	84.44	44.44	8.00	82.00	62	15	75.81				8.14	0.36	95.58				7.39	7.35			
13	109.8	18.4	83.24				71	16	77.46				12.55	0.29	97.69				7.39	7.34	340000	3600	98.94
14	96.6	24.6	74.53				62	13	79.03	21.69	11.34	47.72	10.62	0.56	94.73	6.11	0.54	91.16	7.56	7.05			
15	105.2	28.5	72.91				59	11	81.36				12.27	0.42	96.58				7.53	7.27			
16	94.7	13.0	86.27				60	14	76.67				11.05	0.30	97.29				7.54	7.40			
17	95.8	16.0	83.30				57	13	77.19				9.15	0.28	96.94				7.49	7.35			
18	98.3	27.5	72.02				62	11	82.26				8.37	0.47	94.38				7.45	7.19			
19	99.9	14.9	85.09				58	13	77.59				12.00	0.32	97.33				7.53	7.05			
20	95.1	17.2	81.91				80	12	85.00	25.77	10.84	57.94	11.96	0.29	97.58	5.93	0.39	93.42	7.43	7.28			
21	105.4	19.3	81.69	45.41	5.63	87.60	77	12	84.42				9.94	0.25	97.48				7.40	7.20	360000	2400	99.33
22	100.0	18.8	81.20				66	15	77.27				12.28	0.24	98.05				7.52	7.40			
23	95.0	15.5	83.68				55	11	80.00				10.52	0.27	97.43				7.51	7.45			
24	91.0	10.6	88.35				57	14	75.44				9.33	0.25	97.32				7.49	7.39			
25	103.5	10.0	90.34				71	12	83.10				10.29	0.33	96.79				7.37	7.14			
26	93.5	12.4	86.74				58	10	82.76				11.61	0.29	97.50				7.50	7.12			
27	114.9	10.7	90.69				78	14	82.05				9.00	0.26	97.11				7.45	7.31			
28	100.5	8.8	91.24				67	14	79.10	20.92	9.67	53.78	12.36	0.19	98.46	7.20	0.50	93.06	7.53	7.32			
29	106.2	11.9	88.79				71	13	81.69				8.44	0.26	96.92				7.41	7.29	300000	2700	99.10
30	114.2	9.8	91.42				66	15	77.27				10.51	0.30	97.15				7.38	7.18			
31	103.7	13.3	87.17	39.37	6.11	84.48	63	13	79.37				12.03	0.27	97.76				7.48	7.19			
Average	101.4	15.5	84.58	41.42	6.47	84.32	65	13	80.58	22.14	10.24	53.57	10.57	0.30	97.07	6.22	0.46	92.59	7.46	7.26	345000	2850	99.17

2015 September	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	109.2	11.5	89.47				84	12	85.71	16.36	8.45	48.35	12.63	0.41	96.75	3.88	0.43	88.92	7.52	7.18			
2	102.2	10.9	89.33				74	11	85.14				11.49	0.29	97.48				7.47	7.23	430000	3400	99.21
3	107.7	9.7	90.99	38.81	8.52	78.05	72	11	84.72				12.83	0.31	97.58				7.53	7.12			
4	101.1	12.2	87.93				73	13	82.19				9.04	0.30	96.68				7.38	7.05			
5	98.3	10.6	89.22				69	12	82.61				12.11	0.25	97.94				7.53	7.23			
6	108.1	9.0	91.67				62	9	85.48				10.63	0.23	97.84				7.53	7.25			
7	100.9	7.5	92.57				77	12	84.42	17.63	9.48	46.23	10.36	0.29	97.20	5.02	0.60	88.05	7.36	7.19			
8	95.2	14.1	85.19				71	9	87.32				12.87	0.37	97.13				7.37	7.07			
9	103.3	12.8	87.61				63	10	84.13				12.39	0.30	97.58				7.35	7.14	340000	3300	99.03
10	105.6	20.1	80.97	45.37	5.96	86.86	63	11	82.54				10.31	0.31	96.99				7.42	7.15			
11	102.6	11.6	88.69				76	11	85.53				11.53	0.22	98.09				7.51	7.08			
12	109.6	14.0	87.23				67	12	82.09				12.43	0.20	98.39				7.49	7.20			
13	99.1	12.7	87.18				64	13	79.69				11.55	0.18	98.44				7.45	7.08			
14	93.8	12.3	86.89				75	10	86.67	17.51	8.36	52.26	11.61	0.20	98.28	4.53	0.59	86.98	7.52	7.06			
15	105.3	10.6	89.93				68	12	82.35				9.56	0.34	96.44				7.50	7.14			
16	104.1	8.3	92.03	38.59	5.78	85.02	66	12	81.82				13.21	0.28	97.88				7.48	7.18			
17	99.5	6.7	93.27				65	11	83.08				9.27	0.22	97.63				7.42	7.21			
18	92.3	8.6	90.68				74	14	81.08				10.24	0.24	97.66				7.40	7.13	340000	2700	99.21
19	104.1	7.5	92.80				79	12	84.81				11.22	0.20	98.22				7.48	7.08			
20	92.5	9.9	89.30				84	12	85.71				13.23	0.30	97.73				7.47	7.26			
21	99.4	7.1	92.86				84	14	83.33	18.42	8.34	54.72	11.44	0.19	98.34	5.11	0.42	91.78	7.41	7.11			
22	105.6	9.2	91.29				80	13	83.75				9.83	0.17	98.27				7.36	7.07			
23	97.2	6.8	93.00	38.92	6.11	84.30	69	11	84.06				13.24	0.46	96.53				7.44	7.22			
24	99.0	7.9	92.02				76	13	82.89				9.64	0.39	95.95				7.52	7.16			
25	100.0	10.2	89.80				78	10	87.18				12.84	0.24	98.13				7.52	7.03			
26	102.1	9.0	91.19				63	14	77.78				10.58	0.20	98.11				7.53	7.14			
27	100.7	16.1	84.01				78	12	84.62				12.88	0.87	93.25				7.40	7.12			
28	92.0	13.8	85.00				85	10	88.24	15.96	9.09	43.05	9.12	0.36	96.05	3.97	0.59	85.14	7.31	7.19			
29	102.6	16.0	84.41	39.98	7.05	82.37	64	12	81.25				10.06	0.48	95.23				7.48	7.20	330000	2600	99.21
30	97.8	15.7	83.95				62	14	77.42				9.23	0.30	96.75				7.41	7.18			
Average	101.0	11.1	89.02	40.33	6.68	83.32	72	12	83.59	17.18	8.74	48.92	11.25	0.30	97.28	4.50	0.53	88.17	7.45	7.15	360000	3000	99.16

2015 October	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	92.2	12.9	86.01				80	16	80.00				10.35	0.29	97.20				7.42	7.22			
2	101.2	19.4	80.83				80	10	87.50				9.09	0.31	96.59				7.59	7.10			
3	97.8	21.1	78.43				72	11	84.72				8.63	0.24	97.22				7.55	7.15			
4	99.2	18.3	81.55				72	10	86.11				12.21	0.20	98.36				7.50	7.01			
5	92.7	13.7	85.22				72	12	83.33				11.55	0.27	97.66				7.48	7.09			
6	100.2	11.4	88.62				72	14	80.56				8.78	0.41	95.33				7.44	7.14			
7	103.8	16.4	84.20				76	10	86.84				11.72	0.25	97.87				7.62	7.09			
8	95.8	22.0	77.04	40.39	8.24	79.60	84	12	85.71				8.36	0.29	96.53				7.43	7.02			
9	90.6	14.9	83.55				88	16	81.82	19.56	8.66	55.73	10.20	0.30	97.06	4.15	0.52	87.47	7.55	7.05			
10	96.2	17.2	82.12				80	15	81.25				9.46	0.27	97.15				7.48	7.17			
11	96.5	15.4	84.04				80	11	86.25				10.07	0.30	97.02				7.52	7.17			
12	103.8	12.7	87.76				68	10	85.29				11.01	0.53	95.19				7.52	7.03	430000	3400	99.21
13	93.4	14.0	85.01				68	14	79.41				10.84	0.81	92.53				7.49	7.04			
14	97.4	12.4	87.27				72	10	86.11				12.66	0.22	98.26				7.57	7.08			
15	102.1	11.9	88.34	38.79	10.39	73.21	84	13	84.52				9.78	0.17	98.26				7.61	7.11			
16	94.7	12.7	86.59				84	15	82.14	17.57	7.93	54.87	10.09	0.46	95.44	3.68	0.37	89.95	7.50	7.03			
17	91.9	11.8	87.16				76	12	84.21				9.00	0.59	93.44				7.52	7.17			
18	101.5	15.9	84.33				72	16	77.78				11.96	0.40	96.66				7.50	7.10			
19	95.0	13.2	86.11				76	14	81.58				9.17	0.16	98.26				7.44	7.13			
20	98.8	12.6	87.25				88	13	85.23				12.89	0.34	97.36				7.58	7.19	340000	2600	99.24
21	97.3	15.2	84.38				72	12	83.33	21.38	10.08	52.85	9.56	0.86	91.00	4.04	0.46	88.61	7.62	7.09			
22	102.2	13.5	86.79				84	13	84.52				10.95	0.22	97.99				7.60	7.22			
23	92.1	10.9	88.17	34.96	7.76	77.80	68	12	82.35				12.03	0.20	98.34				7.50	7.13			
24	95.3	12.2	87.20				80	11	86.25				10.25	0.34	96.68				7.44	7.13			
25	93.4	14.1	84.90				80	9	88.75				9.56	0.48	94.98				7.49	7.04			
26	97.2	16.0	83.54				76	12	84.21				11.32	0.30	97.35				7.60	7.06			
27	99.1	14.4	85.47				72	10	86.11				8.25	0.35	95.76				7.47	7.01			
28	93.2	18.8	79.83				68	13	80.88				12.27	0.36	97.07				7.61	7.08	340000	3300	99.03
29	94.6	15.7	83.40				72	14	80.56	18.91	13.24	29.98	8.93	0.58	93.51	5.00	0.39	92.20	7.50	7.20			
30	402.5	11.9	97.04	45.13	8.63	80.88	72	11	84.72				11.23	0.25	97.77				7.54	7.21			
31	93.3	9.9	89.39				84	15					9.67	0.22	97.72				7.47	7.18			
Average	106.6	14.6	85.07	39.82	8.76	77.87	77	12	83.74	19.36	9.98	48.36	10.38	0.35	96.50	4.22	0.44	89.56	7.52	7.11	370000	3100	99.16

2015 November	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	94.2	8.6	90.87				88	15	82.95				8.69	0.26	97.01				7.58	7.26			
2	96.2	6.8	92.93				80	14	82.50				11.01	0.22	98.00				7.74	7.30			
3	93.4	10.2	89.08				72	15	79.17	17.59	6.82	61.23	8.36	0.40	95.22	4.57	0.55	87.96	7.61	7.38			
4	96.2	15.5	83.89				84	18	78.57				9.53	0.30	96.85				7.67	7.40	340000	2600	99.24
5	93.5	19.2	79.47				76	15	80.26				7.00	0.21	97.00				7.49	7.24			
6	93.5	16.6	82.25	38.35	7.20	81.23	76	17	77.63				9.90	0.26	97.37				7.73	7.30			
7	101.4	16.9	83.33				80	14	82.50				10.89	0.21	98.07				7.55	7.32			
8	94.0	13.8	85.32				84	16	80.95				8.79	0.18	97.95				7.51	7.32			
9	94.6	11.9	87.42				84	15	82.14	19.56	9.17	53.12	7.75	0.42	94.58	5.01	0.42	91.62	7.53	7.24			
10	95.1	16.6	82.54				76	16	78.95				8.09	0.37	95.43				7.66	7.37			
11	98.9	18.4	81.40				88	17	80.68				9.44	0.30	96.82				7.73	7.24	430000	2200	99.49
12	94.3	16.8	82.18				84	16	80.95				7.23	0.27	96.27				7.69	7.26			
13	96.0	25.2	73.75	39.41	8.11	79.42	80	15	81.25				8.03	0.26	96.76				7.55	7.30			
14	95.1	17.8	81.28				72	18	75.00				10.16	0.28	97.24				7.66	7.40			
15	101.4	19.1	81.16				88	15	82.95				8.72	0.28	96.79				7.59	7.25			
16	95.6	17.3	81.90				88	18	79.55				10.65	0.71	93.33				7.65	7.29			
17	95.3	14.5	84.78				88	14	84.09	15.42	8.48	45.01	7.48	0.42	94.39	4.50	0.53	88.22	7.66	7.39			
18	100.2	15.4	84.63				76	13	82.89				9.42	0.61	93.52				7.64	7.37	330000	2200	99.33
19	96.4	12.0	87.55				88	16	81.82				7.79	0.92	88.19				7.50	7.34			
20	93.8	14.1	84.97	37.57	6.77	81.98	76	18	76.32				8.86	0.28	96.84				7.66	7.39			
21	100.0	15.7	84.30				76	14	81.58				7.37	0.41	94.44				7.69	7.31			
22	97.5	15.1	84.51				76	17	77.63				10.06	0.35	96.52				7.51	7.27			
23	101.6	15.9	84.35				84	13	84.52				9.23	0.29	96.86				7.60	7.34			
24	101.7	13.6	86.63				88	14	84.09	16.15	9.16	43.28	10.04	0.29	97.11	4.24	0.40	90.57	7.51	7.30			
25	101.5	15.7	84.53				80	16	80.00				9.99	0.42	95.80				7.62	7.33			
26	101.5	17.8	82.46				88	13	85.23				7.96	0.31	96.11				7.55	7.36	490000	2700	99.45
27	99.6	14.4	85.54	43.81	8.01	81.72	76	16	78.95				10.00	0.24	97.60				7.68	7.25			
28	95.4	12.7	86.69				84	17	79.76				9.57	0.20	97.91				7.52	7.22			
29	95.4	17.6	81.55				76	15	80.26				8.88	0.23	97.41				7.71	7.32			
30	102.0	14.1	86.18				88	13	85.23	16.46	8.89	45.99	7.93	0.19	97.60	3.75	0.49	86.93	7.60	7.38			
Average	97.2	15.3	84.25	39.79	7.52	81.09	81	15	80.95	17.04	8.50	49.73	8.96	0.34	96.17	4.41	0.48	89.06	7.61	7.31	397500	2425	99.38

2015 December	COD_{cr}(mg/L)		Removal%	BOD_5(mg/L)		Removal%	SS(mg/L)		Removal%	TN(mg/L)		Removal%	NH_3-N(mg/L)		Removal%	TP(mg/L)		Removal%	pH		Fecal Coliforms(unit/L)		Removal%
	Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent		Total Influent	Total Effluent	Total Influent	Total Effluent	
1	99.2	16.5	83.37				68	17	75.00				7.81	0.39	95.01				7.54	7.24			
2	95.3	19.7	79.33				76	15	80.26				10.17	0.26	97.44				7.71	7.33	340000	2600	99.24
3	100.9	14.2	85.93	42.42	6.87	83.80	84	20	76.19				9.49	0.23	97.58				7.50	7.37			
4	103.5	15.0	85.51				76	14	81.58	18.36	6.11	66.72	10.17	0.22	97.84	3.56	0.38	89.33	7.53	7.25			
5	106.1	13.6	87.18				72	18	75.00				9.33	0.24	97.43				7.49	7.29			
6	98.7	13.9	85.92				76	15	80.26				8.14	0.21	97.42				7.50	7.33			
7	102.5	17.6	82.83				72	17	76.39				7.52	0.30	96.01				7.64	7.40			
8	95.5	14.4	84.92				80	16	80.00				9.18	0.41	95.53				7.70	7.38	430000	3300	99.23
9	105.2	12.3	88.31				80	18	77.50				8.82	0.33	96.26				7.62	7.44			
10	105.0	16.9	83.90	39.98	9.23	76.91	76	19	75.00				7.83	0.30	96.17				7.59	7.33			
11	98.0	14.1	85.61				68	18	73.53	22.61	10.07	55.46	8.51	0.27	96.83	4.23	0.40	90.54	7.70	7.24			
12	100.6	12.9	87.18				72	15	79.17				9.06	0.26	97.13				7.64	7.29			
13	106.2	12.7	88.04				76	16	78.95				9.43	0.34	96.39				7.58	7.31			
14	99.8	15.5	84.47				80	20	75.00				10.36	0.25	97.59				7.61	7.26			
15	98.1	14.9	84.81				76	19	75.00				8.39	0.30	96.42				7.53	7.42	340000	2200	99.35
16	103.4	18.7	81.91	38.23	7.63	80.04	68	14	79.41				6.95	0.27	96.12				7.60	7.26			
17	100.3	20.6	79.46				80	18	77.50				10.24	0.24	97.66				7.53	7.36			
18	98.6	18.5	81.24				84	16	80.95	20.58	8.64	58.02	7.25	0.23	96.83	2.99	0.31	89.63	7.69	7.33			
19	99.3	18.1	81.77				72	19	73.61				10.46	0.32	96.94				7.72	7.31			
20	102.4	15.2	85.16				80	14	82.50				9.30	0.29	96.88				7.63	7.41			
21	100.6	18.6	81.51				72	20	72.22				6.85	0.22	96.79				7.67	7.25			
22	105.0	20.6	80.38				76	17	77.63				10.18	0.49	95.19				7.54	7.29			
23	98.9	17.8	82.00				72	16	77.78				8.94	0.36	95.97				7.49	7.27			
24	103.5	23.1	77.68	37.32	6.97	81.32	72	19	73.61				10.48	0.29	97.23				7.49	7.32			
25	102.6	16.4	84.02				84	13	84.52	19.85	9.41	52.59	7.88	0.26	96.70	3.74	0.39	89.57	7.62	7.45			
26	106.2	10.2	90.40				76	16	78.95				10.38	0.30	97.11				7.60	7.27			
27	96.1	8.9	90.74				68	17	75.00				9.16	0.22	97.60				7.57	7.41			
28	106.6	10.0	90.62				76	15	80.26				6.52	0.23	96.47				7.60	7.38	330000	2300	99.30
29	100.3	14.7	85.34				80	19	76.25				9.77	0.30	96.93				7.58	7.41			
30	101.2	12.4	87.75				68	17	75.00				7.81	0.29	96.29				7.70	7.44			
31	96.9	16.0	83.49	39.57	8.07		72	15	79.17				10.46	0.34	96.75				7.55	7.38			
Average	101.2	15.6	84.54	39.50	7.75	80.52	75	17	77.47	20.35	8.56	58.20	8.93	0.29	96.73	3.63	0.37	89.77	7.60	7.34	360000	2600	99.28

Annex 2 Chao'an District Wastewater Treatment Plant Water Quality Monitoring Data

Monitoring Items	15th, Jan		9th, Feb		20th, Mar		16th, Apr		6th, May		3rd, Jun	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
pH	6.25	6.73	7.33	7.21	6.44	6.52	6.72	6.94	6.87	6.73	6.87	6.94
COD	96.3	28.1	103	24.9	101	26.5	102	25.8	98.7	23.5	121	26.1
BOD_5	39.7	11.6	40.4	11.4	42.2	12.2	40.3	11.6	38.7	10.1	38.3	9.5
Ammonia Nitrogen	14.7	0.60	14.0	0.38	11.6	1.09	15.2	1.25	11.2	0.39	12.6	0.35
Anionic Surfactants	0.60	0.21	0.65	0.17	0.72	0.26	0.75	0.45	0.50	0.19	0.46	0.32
Total Phosphorus	0.98	0.48	1.01	0.52	1.04	0.38	0.77	0.39	0.78	0.38	0.80	0.38
Suspended solids	108	15	113	15	108	16	122	16	102	16	97	15
Total Nitrogen	17.1	1.34	16.3	1.68	13.1	3.80	16.7	2.25	13.2	0.81	15.5	0.77
Arsenic	0.0019	0.0012	0.0015	0.0010	0.0011	0.0008	0.0016	0.0011	0.0013	0.0010	0.0021	0.0018
Hexavalent chromium	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)
Total chromium	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)
Chromaticity	15	4	16	4	16	4	20	2	16	2	8	2

Monitoring Items	21st, Jul		13th, Aug		9th, Sep		8th, Oct		2nd, Nov		8th, Dec	
	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment	Before treatment	After treatment
pH	6.97	6.92	7.02	6.93	7.03	6.97	6.97	6.93	6.52	6.85	6.95	6.87
COD	130	25.4	131	27.4	128	24.1	128	26.8	132	25.4	127	27.4
BOD_5	44.3	9.6	45.3	9.4	43.6	8.7	44.4	9.6	46.3	9.5	44.3	9.4
Ammonia Nitrogen	13.1	0.77	14.6	0.85	15.6	0.65	12.7	0.56	17.8	0.78	13.5	1.15
Anionic Surfactants	0.71	0.33	0.79	0.36	0.70	0.25	0.63	0.26	0.66	0.29	0.62	0.32
Total Phosphorus	0.76	0.34	0.87	0.35	0.92	0.31	0.74	0.34	0.81	0.37	0.92	0.45
Suspended solids	128	18	128	18	98	15	105	16	136	18	136	15
Total Nitrogen	14.6	1.03	16.0	1.21	17.0	1.01	16.2	1.31	19.5	1.40	18.5	2.62
Arsenic	0.0018	0.0014	0.0017	0.0013	0.0015	0.0012	0.0019	0.0016	0.0016	0.0011	0.0014	0.0010
Hexavalent chromium	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)
Total chromium	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)	0.004(L)
Chromaticity	16	4	15	4	18	4	16	2	16	2	20	2

Annex 3 Huazhou Wastewater Treatment Plant Water Quality Monitoring Data

化州市环境监测站

监 测 报 告

报告编号：2015-03-011

委托单位：化州市环保局

被监测单位：化州市城市生活污水处理厂

监测类别：监督监测

2015 年 4 月 6 日

化州市环境监测站

废水监测报告

实验室地址：化州市宝山路 50 号　　第 1 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-3-011	采样人员	刘付东、蔡士军
采样日期	2015 年 3 月 27 日	分析人员	杨夏燕、云虹、马丽
分析日期	2015 年 3 月 28 日	样品类别	废水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
pH 值	水质 pH 值的测定 玻璃电极法 GB/T6920-1986	悬浮物	水质 悬浮物的测定 重量法 GB/T11901-1989
化学需氧量	快速密闭催化消解法 《水和废水监测分析方法》（第四版） 国家环境保护总局(2002 年)	氨氮	水质 氨氮的测定 纳氏试剂分光光度法 HJ535-2009

监 测 结 果

单位：mg/L(pH 值除外)

采样位置	采样时间	样品编号	样品描述	pH 值	悬浮物	化学需氧量	氨氮
污水入口	8:30	150327WW001	灰色、臭味	7.86	76	154	15.40
污水入口	11:20	150327WW003	灰色、臭味	7.85	75	147	15.36
污水入口	14:30	150327WW005	灰色、臭味	7.87	75	161	15.44
污水入口	17:20	150327WW007	灰色、臭味	7.85	77	147	15.41
污水出口	8:40	150327WW002	无颜色、无气味	7.51	7	20.1	0.85
污水出口	11:30	150327WW004	无颜色、无气味	7.52	8	26.8	0.84
污水出口	14:40	150327WW006	无颜色、无气味	7.53	8	26.8	0.86
污水出口	17:30	150327WW008	无颜色、无气味	7.52	7	33.5	0.85
标准限值	--	--	--	6~9	20	40	10
执行标准	《茂名市水污染物排放限值》（DB44/56-2003）的第Ⅱ时段一级标准。						
注：测定时工况：排污正常。							

编制人：何志业

复核人：　　审核人：　　签发人：

职务：站长

签发日期：2015 年 4 月 6 日

化州市环境监测站

废水监测报告

实验室地址：化州市宝山路 50 号　　第 2 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-3-011	采样人员	王凯、蔡士军
采样日期	2015 年 3 月 27 日	分析人员	杨夏燕、云虹、马丽
分析日期	2015 年 3 月 28 日	样品类别	废水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
色度	水质　色度的测定 铂钴比色法、稀释倍数法 GB/T11903-1989	五日生化需氧量	水质　五日生化需氧量(BOD5)的测定 稀释接种法 HJ505-2009
阴离子表面活性剂	水质　阴离子表面活性剂的测定 亚甲蓝分光光度法 GB 7494-1987	总磷	水质　总磷的测定 钼酸铵分光光度法 GB 11893-1989

监 测 结 果

单位：mg/L(标明除外)

采样位置	采样时间	样品编号	样品描述	LAS	色度(倍)	生化需氧量	TP
污水入口	8:30	150327WW001	灰色、臭味	0.41	64	67.0	4.160
污水入口	11:20	150327WW003	灰色、臭味	0.37	64	70.0	4.184
污水入口	14:30	150327WW005	灰色、臭味	0.39	64	66.0	3.962
污水入口	17:20	150327WW007	灰色、臭味	0.40	64	64.0	4.264
污水出口	8:40	150327WW002	无颜色、无气味	0.25	32	8.00	0.782
污水出口	11:30	150327WW004	无颜色、无气味	0.24	32	10.0	0.795
污水出口	14:40	150327WW006	无颜色、无气味	0.26	32	7.00	0.788
污水出口	17:30	150327WW008	无颜色、无气味	0.25	16	6.00	0.813
标准限值	--	--	--	5.0	40	20	--
执行标准	《茂名市水污染物排放限值》(DB44/56-2003）的第Ⅱ时段一级标准。						
注：测定时工况：排污正常。							

编制人：何志业

复核人：　　审核人：　　签发人：

职务：站长

签发日期：2015年 4月 6日

化州市环境监测站

监 测 报 告

报告编号：2015-06-001

委托单位：化州市环保局

被监测单位：化州市城市生活污水处理厂

监测类别：监督监测

2015 年 6 月 10 日

化州市环境监测站

监 测 报 告

实验室地址：化州市宝山路 50 号　　第 1 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-06-001	采样人员	刘付东、蔡土军
采样日期	2015 年 6 月 1 日	分析人员	李雪波、杨夏燕、云虹、马丽、吴幸玲
分析日期	2015 年 6 月 2 日	样品类别	废水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
pH 值	水质 pH 值的测定 玻璃电极法 GB/T6920-1986	悬浮物	水质　悬浮物的测定 重量法 GB/T11901-1989
化学需氧量	快速密闭催化消解法 《水和废水监测分析方法》（第四版） 国家环境保护总局(2002 年)	氨氮	水质　氨氮的测定 纳氏试剂分光光度法 HJ535-2009

监 测 结 果

单位：mg/L(pH 值除外)

采样位置	采样时间	样品编号	样品描述	pH 值	悬浮物	化学需氧量	氨氮
污水入口	8:30	150601WW001	灰色、臭味	7.96	96	160	17.68
污水入口	11:20	150601WW003	灰色、臭味	7.94	94	147	17.71
污水入口	14:30	150601WW005	灰色、臭味	7.94	95	167	17.64
污水入口	17:20	150601WW007	灰色、臭味	7.95	97	140	17.73
污水出口	8:40	150601WW002	无颜色、无气味	7.35	10	20.0	1.18
污水出口	11:30	150601WW004	无颜色、无气味	7.36	11	13.3	1.21
污水出口	14:40	150601WW006	无颜色、无气味	7.35	10	26.7	1.15
污水出口	17:30	150601WW008	无颜色、无气味	7.37	9	20.0	1.23
标准限值	--	--	--	6~9	20	40	10
执行标准	《水污染物排放限值》（DB44/26-2001）的第Ⅱ时段一级标准。						
注：测定时工况：排污正常。							

编制人：何志业

复核人：李琼立　　审核人：蔡春萍　　签发人：

职务：站长

签发日期：2015 年 6 月 10 日

化州市环境监测站

监 测 报 告

实验室地址：化州市宝山路 50 号　　第 2 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-06-001	采样人员	刘付东、蔡土军
采样日期	2015 年 6 月 1 日	分析人员	李雪波、杨夏燕、云虹、马丽、吴幸玲
分析日期	2015 年 6 月 2 日	样品类别	废水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
色度	水质　色度的测定 铂钴比色法、稀释倍数法 GB/T11903-1989	五日生化需氧量	水质 五日生化需氧量(BOD5)的测定 稀释接种法 HJ505-2009
阴离子表面活性剂	水质　阴离子表面活性剂的测定 亚甲蓝分光光度法 GB 7494-1987	总磷	水质　总磷的测定 钼酸铵分光光度法 GB 11893-1989

监 测 结 果

单位：mg/L(标明除外)

采样位置	采样时间	样品编号	样品描述	LAS	色度(倍)	生化需氧量	TP
污水入口	8:30	150601WW001	灰色、臭味	0.43	32	85	4.253
污水入口	11:20	150601WW003	灰色、臭味	0.36	32	83	4.124
污水入口	14:30	150601WW005	灰色、臭味	0.40	32	84	3.950
污水入口	17:20	150601WW007	灰色、臭味	0.38	32	84	4.260
污水出口	8:40	150601WW002	无颜色、无气味	0.28	16	12	0.825
污水出口	11:30	150601WW004	无颜色、无气味	0.23	16	11	0.783
污水出口	14:40	150601WW006	无颜色、无气味	0.24	16	12	0.798
污水出口	17:30	150601WW008	无颜色、无气味	0.27	16	13	0.808
标准限值	--	--	--	5.0	40	20	--
执行标准	《水污染物排放限值》（DB44/26-2001）的第Ⅱ时段一级标准。						
注：测定时工况：排污正常。							

编制人：何志业

复核人：李琼立　　审核人：蔡春萍　　签发人：

职务：站长

签发日期：2015 年 6 月 10 日

CMA 2013190996U 有效期至2016年1月27日

化州市环境监测站

监 测 报 告

报告编号：2015-08-024

委托单位：化州市环保局

被监测单位：化州市城市生活污水处理厂

监测类别：监督监测

2015 年 8 月 25 日

CMA 2013190996U 有效期至2016年1月27日

化州市环境监测站

监 测 报 告

实验室地址：化州市宝山路 50 号　　第 1 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-08-024	采样人员	刘付东、蔡士军
采样日期	2015 年 8 月 19 日	分析人员	李雪波、云虹、马丽、吴幸玲
分析日期	2015 年 8 月 20 日	样品类别	生活污水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
pH 值	水质 pH 值的测定 玻璃电极法 GB/T6920-1986	悬浮物	水质 悬浮物的测定 重量法 GB/T11901-1989
化学需氧量	快速密闭催化消解法 《水和废水监测分析方法》（第四版） 国家环境保护总局(2002 年)	氨氮	水质 氨氮的测定 纳氏试剂分光光度法 HJ535-2009

监 测 结 果

单位：mg/L(pH 值除外)

采样位置	采样时间	样品编号	样品描述	pH 值	悬浮物	化学需氧量	氨氮
污水入口	8:30	150819WW005	灰黑色、臭味	7.83	77	207	20.14
污水入口	11:20	150819WW007	灰黑色、臭味	7.85	78	193	20.08
污水入口	14:30	150819WW009	灰黑色、臭味	7.82	77	220	20.03
污水入口	17:20	150819WW011	灰黑色、臭味	7.84	76	200	20.08
污水出口	8:40	150819WW006	无颜色、无气味	7.05	11	26.7	3.25
污水出口	11:30	150819WW008	无颜色、无气味	7.04	9	20.0	3.21
污水出口	14:40	150819WW010	无颜色、无气味	7.06	10	33.3	3.19
污水出口	17:30	150819WW012	无颜色、无气味	7.07	9	20.0	3.23
标准限值	--	--	--	6~9	20	40	10
执行标准	《水污染物排放限值》（DB44/26-2001）的第Ⅱ时段一级标准。						

注：测定时工况：排污正常。

编制人：何志业

复核人：　　审核人：　　签发人：

职务：站长

签发日期：2015 年 8 月 25 日

化州市环境监测站

监 测 报 告

实验室地址：化州市宝山路 50 号　　第 2 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-08-024	采样人员	刘付东、蔡士军
采样日期	2015 年 8 月 19 日	分析人员	李雪波、云虹、马丽、吴幸玲
分析日期	2015 年 8 月 20 日	样品类别	生活污水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
色度	水质　色度的测定 铂钴比色法、稀释倍数法 GB/T11903-1989	五日生化需氧量	水质　五日生化需氧量(BOD5)的测定 稀释接种法 HJ505-2009
阴离子表面活性剂	水质　阴离子表面活性剂的测定 亚甲蓝分光光度法 GB 7494-1987	总磷	水质　总磷的测定 钼酸铵分光光度法 GB 11893-1989

监 测 结 果

单位：mg/L(标明除外)

采样位置	采样时间	样品编号	样品描述	LAS	色度(倍)	五日生化需氧量	TP
污水入口	8:30	150819WW005	灰黑色、臭味	0.038	64	103	3.890
污水入口	11:20	150819WW007	灰黑色、臭味	0.034	64	106	3.875
污水入口	14:30	150819WW009	灰黑色、臭味	0.041	64	105	3.903
污水入口	17:20	150819WW011	灰黑色、臭味	0.034	64	104	3.875
污水出口	8:40	150819WW006	无颜色、无气味	0.023	8	10	0.875
污水出口	11:30	150819WW008	无颜色、无气味	0.020	8	11	0.862
污水出口	14:40	150819WW010	无颜色、无气味	0.027	8	12	0.890
污水出口	17:30	150819WW012	无颜色、无气味	0.020	8	11	0.862
标准限值	--	--	--	5.0	40	20	--
执行标准	《水污染物排放限值》(DB44/26-2001)的第II时段一级标准。						

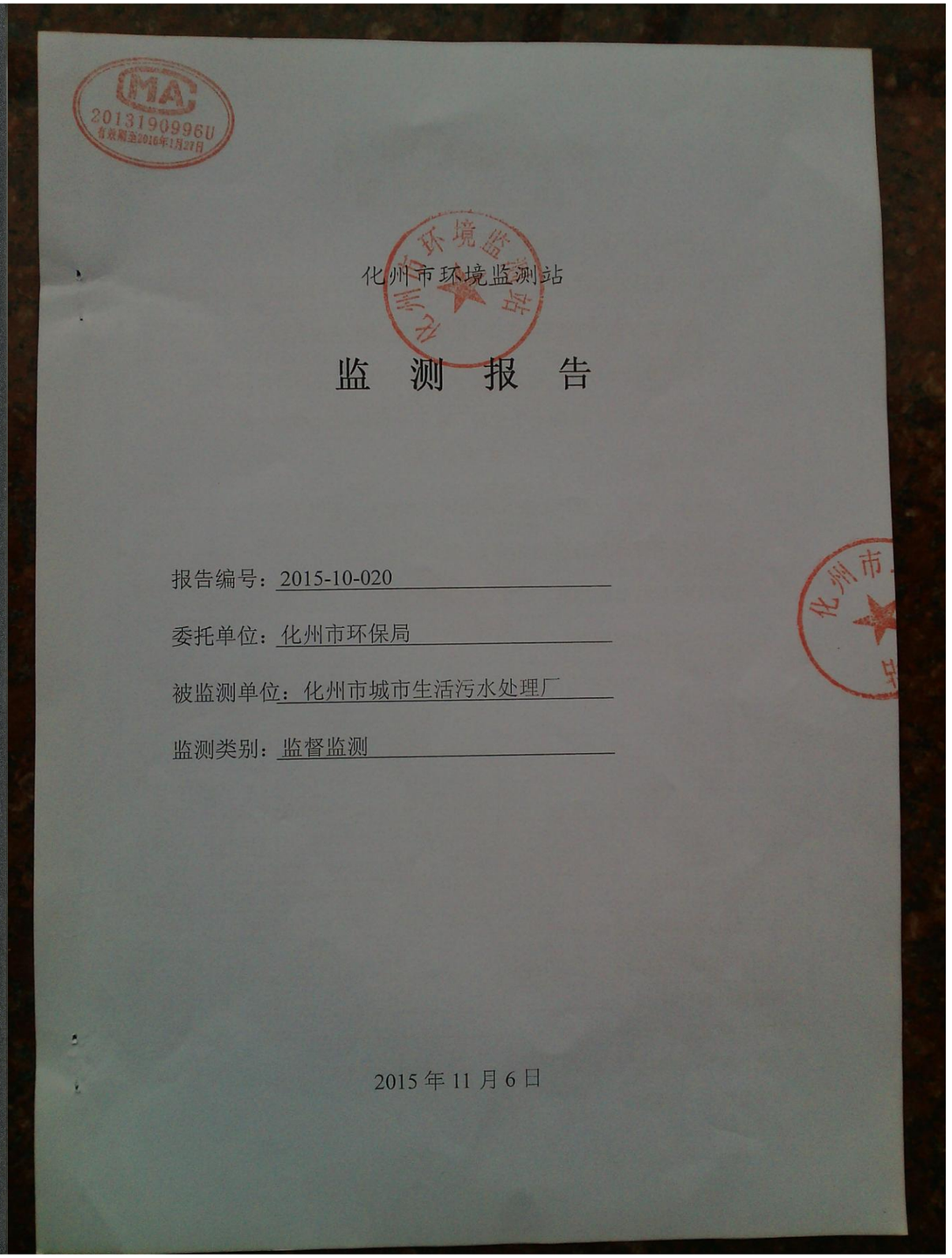
注：测定时工况：排污正常。

编制人：何志业

复核人：　　审核人：　　签发人：

职务：站长

签发日期：2015 年 8 月 25 日



化州市环境监测站

监 测 报 告

报告编号：2015-10-020

委托单位：化州市环保局

被监测单位：化州市城市生活污水处理厂

监测类别：监督监测

2015 年 11 月 6 日

报 告 编 制 声 明

1、本报告只适用于监测目的、范围。

2、本报告只对来样或自采样负监测技术责任。对本报告有疑问，请向我站技术质控室查询，来函来电请注明报告编号。对监测结果若有异议，应于收到本报告之日起 15 日内向我站提出复测申请，逾期不予受理。对于不可保存的样品，恕不受理复测。

3、本报告涂改无效；无报告复核人、审核人、签发人签字无效。

4、本报告无本站业务专用章及 CMA 章无效。

5、未经本站书面批准，不得部分复制本报告。本报告由化州市环境监测站解释。

本站地址：化州市宝山路 50 号

电话：（0668）7225244

邮政编码 525100

站长：李冠文

质量负责人：李冠文

技术负责人：吴学邦

CMA 2013190996U 有效期至2019年1月27日

化州市环境监测站

监 测 报 告

实验室地址：化州市宝山路 50 号　　第 1 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-10-020	采样人员	刘付东、蔡士军
采样日期	2015 年 10 月 28 日	分析人员	杨夏燕、云虹、马丽、吴幸玲
分析日期	2015 年 10 月 29 日	样品类别	废水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
pH 值	水质 pH 值的测定 玻璃电极法 GB/T6920-1986	悬浮物	水质 悬浮物的测定 重量法 GB/T11901-1989
化学需氧量	快速密闭催化消解法 《水和废水监测分析方法》（第四版） 国家环境保护总局(2002 年)	氨氮	水质 氨氮的测定 纳氏试剂分光光度法 HJ535-2009

监 测 结 果

单位：mg/L(pH 值除外)

采样位置	采样时间	样品编号	样品描述	pH 值	悬浮物	化学需氧量	氨氮
污水入口	8:30	151028WW001	灰白色、臭味	7.92	76	168	16.55
污水出口	8:50	151028WW002	无颜色、无气味	7.74	9	20.2	2.01
污水入口	11:20	151028WW003	灰白色、臭味	7.90	75	148	16.60
污水出口	11:30	151028WW004	无颜色、无气味	7.75	10	26.7	2.04
污水入口	14:40	151028WW005	灰白色、臭味	7.89	77	161	16.62
污水出口	14:50	151028WW006	无颜色、无气味	7.72	8	13.4	2.05
污水入口	17:20	151028WW007	灰白色、臭味	7.93	73	155	16.58
污水出口	17:30	151028WW008	无颜色、无气味	7.76	8	20.2	2.19
标准限值	--	--	--	6~9	20	40	10
执行标准	《水污染物排放限值》（DB44/26-2001）的第Ⅱ时段一级标准。						
注：测定时工况：排污正常。							

编制人：何志业

复核人：李冠文　　审核人：李春燕　　签发人：李冠文

职务：站长

签发日期：2015年 11 月 6 日

化州市环境监测站

监测报告

实验室地址：化州市宝山路 50 号　　第 2 页/共 2 页

委托方名称	化州市环保局	委托方地址	化州市府九楼
报告编号	2015-10-020	采样人员	刘付东、蔡士军
采样日期	2015 年 10 月 28 日	分析人员	李雪波、云虹、马丽、吴幸玲
分析日期	2015 年 10 月 29 日	样品类别	生活污水
采样地点	化州市城市生活污水处理厂		

监 测 依 据

监测项目	方法来源	监测项目	方法来源
色度	水质　色度的测定 铂钴比色法、稀释倍数法 GB/T11903-1989	五日生化需氧量	水质 五日生化需氧量(BOD5)的测定 稀释接种法 HJ505-2009
阴离子表面活性剂	水质　阴离子表面活性剂的测定 亚甲蓝分光光度法 GB 7494-1987	总磷	水质　总磷的测定 钼酸铵分光光度法 GB 11893-1989

监 测 结 果

单位：mg/L(标明除外)

采样位置	采样时间	样品编号	样品描述	LAS	色度(倍)	五日生化需氧量	TP
污水入口	8:30	151028WW001	灰白色、臭味	0.40	64	85.0	3.839
污水出口	8:50	151028WW002	无颜色、无气味	0.25	8	10.8	0.738
污水入口	11:20	151028WW003	灰白色、臭味	0.38	64	85.8	3.791
污水出口	11:30	151028WW004	无颜色、无气味	0.22	8	10.2	0.720
污水入口	14:40	151028WW005	灰白色、臭味	0.43	64	86.2	3.856
污水出口	14:50	151028WW006	无颜色、无气味	0.20	8	10.0	0.727
污水入口	17:20	151028WW007	灰白色、臭味	0.39	64	86.0	3.770
污水出口	17:30	151028WW008	无颜色、无气味	0.26	8	10.1	0.741
标准限值	--	--	--	5.0	40	20	--
执行标准	《水污染物排放限值》(DB44/26-2001）的第 II 时段一级标准。						
注：测定时工况：排污正常。							

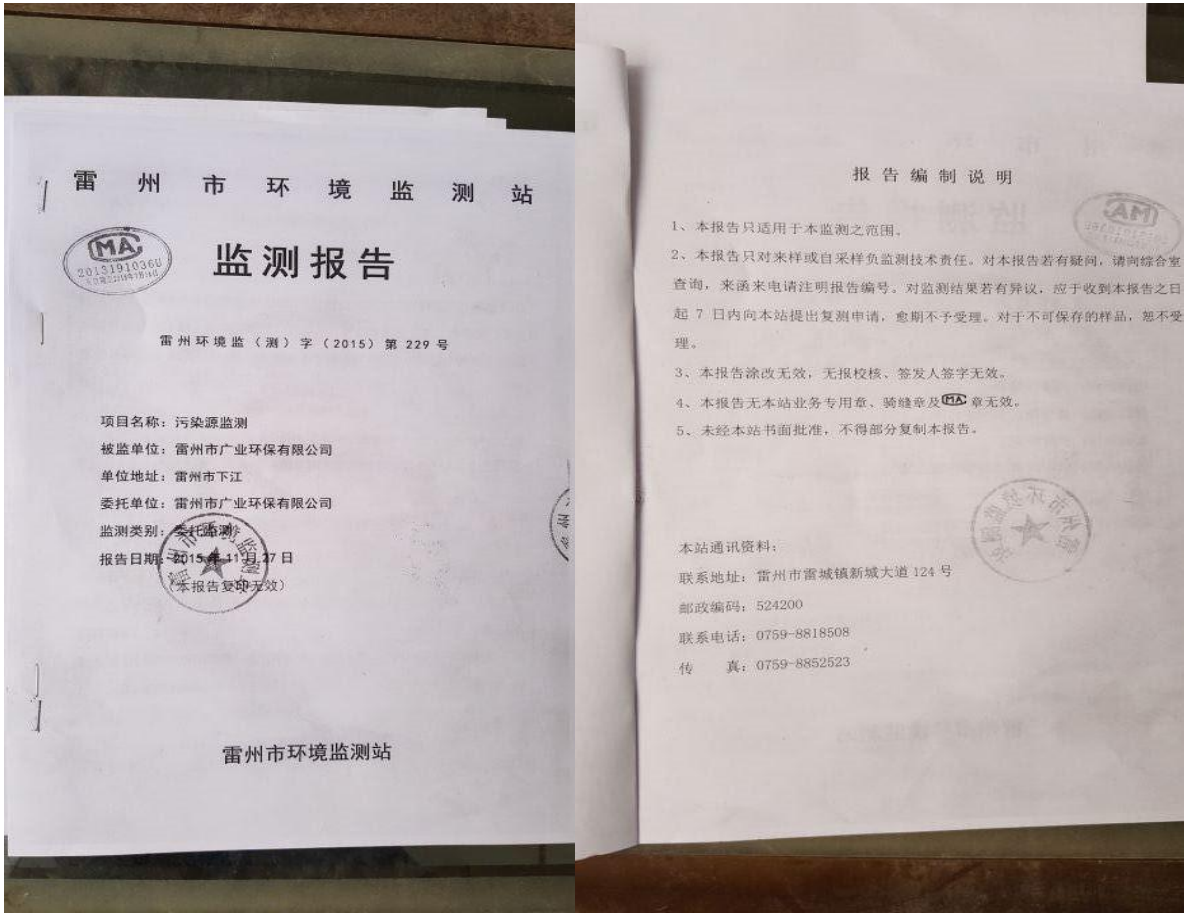
编制人：何志业

复核人：　　审核人：　　签发人：

职务：站长

签发日期：2015年 11月 6日

Annex 4 Leizhou Wastewater Treatment Plant Water Quality Monitoring data



雷 州 市 环 境 监 测 站

监测报告

雷州环境监（测）字（2015）第 229 号

项目名称：污染源监测

被监单位：雷州市广业环保有限公司

单位地址：雷州市下江

委托单位：雷州市广业环保有限公司

监测类别：委托监测

报告日期：2015 年 11 月 27 日

（未报告复印无效）

雷州市环境监测站

报 告 编 制 说 明

1、本报告只适用于本监测之范围。

2、本报告只对来样或自采样负监测技术责任。对本报告若有疑问，请向综合室查询，来函来电请注明报告编号。对监测结果若有异议，应于收到本报告之日起 7 日内向本站提出复测申请，愈期不予受理。对于不可保存的样品，恕不受理。

3、本报告涂改无效，无报校核、签发人签字无效。

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5、未经本站书面批准，不得部分复制本报告。

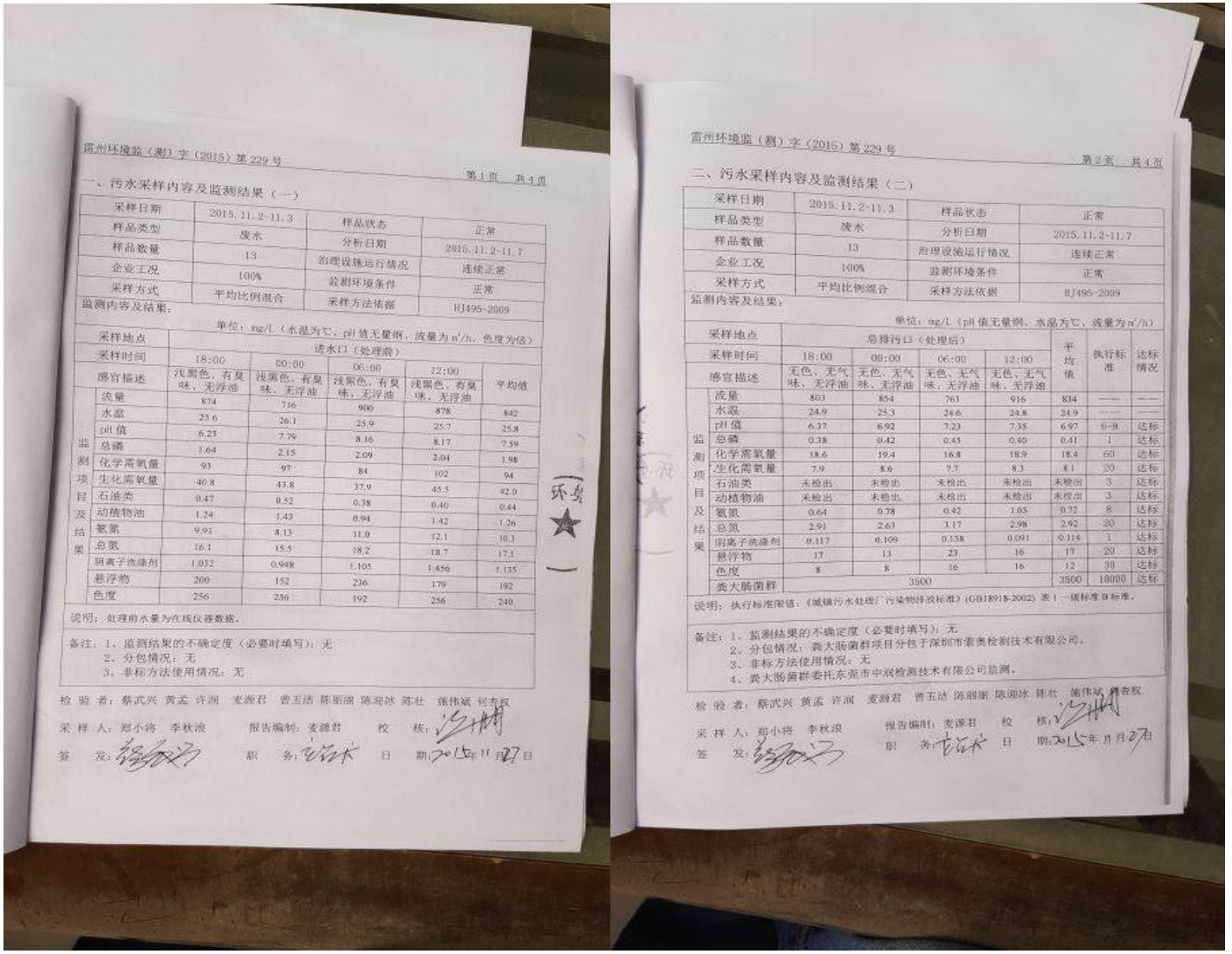
本站通讯资料：

联系地址：雷州市雷城镇新城大道 124 号

邮政编码：524200

联系电话：0759-8818508

传　　真：0759-8852523



雷州环境监（测）字（2015）第229号 第1页 共4页

一、污水采样内容及监测结果（一）

采样日期	2015.11.2-11.3	样品状态	正常
样品类型	废水	分析日期	2015.11.2-11.7
样品数量	13	治理设施运行情况	连续正常
企业工况	100%	监测环境条件	正常
采样方式	平均比例混合	采样方法依据	HJ495-2009

监测内容及结果：

单位：mg/L（水温为℃，pH值无量纲，流量为m³/h，色度为倍）

采样地点	进水口（处理前）				
采样时间	18:00	00:00	06:00	12:00	平均值
感官描述	浅黑色，有臭味，无浮油	浅黑色，有臭味，无浮油	浅黑色，有臭味，无浮油	浅黑色，有臭味，无浮油	
流量	874	716	900	878	842
水温	25.6	26.1	25.9	25.7	25.8
pH值	6.23	7.79	8.16	8.17	7.59
总磷	1.64	2.15	2.09	2.04	1.98
化学需氧量	93	97	84	102	94
生化需氧量	40.8	43.8	37.9	45.5	42.0
石油类	0.47	0.52	0.38	0.40	0.44
动植物油	1.24	1.43	0.94	1.42	1.26
氨氮	9.91	8.13	11.0	12.1	10.3
总氮	16.1	15.5	18.2	18.7	17.1
阴离子洗涤剂	1.032	0.948	1.105	1.456	1.135
悬浮物	200	152	236	179	192
色度	256	256	192	256	240

监测项目及结果

说明：处理前水量为在线仪器数据。

备注：1、监测结果的不确定度（必要时填写）：无
2、分包情况：无
3、非标方法使用情况：无

检验者：蔡武兴 黄孟 许润 麦源君 曾玉洁 陈丽丽 陈迎冰 陈壮 施伟斌 柯杏权

采样人：郑小将 李秋浪 报告编制：麦源君 校 核：

签 发： 职 务： 日 期：2015年11月27日

雷州环境监（测）字（2015）第229号 第2页 共4页

二、污水采样内容及监测结果（二）

采样日期	2015.11.2-11.3	样品状态	正常
样品类型	废水	分析日期	2015.11.2-11.7
样品数量	13	治理设施运行情况	连续正常
企业工况	100%	监测环境条件	正常
采样方式	平均比例混合	采样方法依据	HJ495-2009

监测内容及结果：

单位：mg/L（pH值无量纲，水温为℃，流量为m³/h）

采样地点	总排污口（处理后）				平均值	执行标准	达标情况
采样时间	18:00	00:00	06:00	12:00			
感官描述	无色，无气味，无浮油	无色，无气味，无浮油	无色，无气味，无浮油	无色，无气味，无浮油			
流量	803	854	761	916	834	——	——
水温	24.9	25.3	24.6	24.8	24.9	——	——
pH值	6.37	6.92	7.23	7.35	6.97	6-9	达标
总磷	0.38	0.42	0.45	0.40	0.41	1	达标
化学需氧量	18.6	19.4	16.8	18.9	18.4	60	达标
生化需氧量	7.9	8.6	7.7	8.3	8.1	20	达标
石油类	未检出	未检出	未检出	未检出	未检出	3	达标
动植物油	未检出	未检出	未检出	未检出	未检出	3	达标
氨氮	0.64	0.78	0.42	1.03	0.72	8	达标
总氮	2.91	2.63	3.17	2.98	2.92	20	达标
阴离子洗涤剂	0.117	0.109	0.138	0.091	0.114	1	达标
悬浮物	17	13	23	16	17	20	达标
色度	8	8	16	16	12	30	达标
粪大肠菌群	3500				3500	10000	达标

监测项目及结果

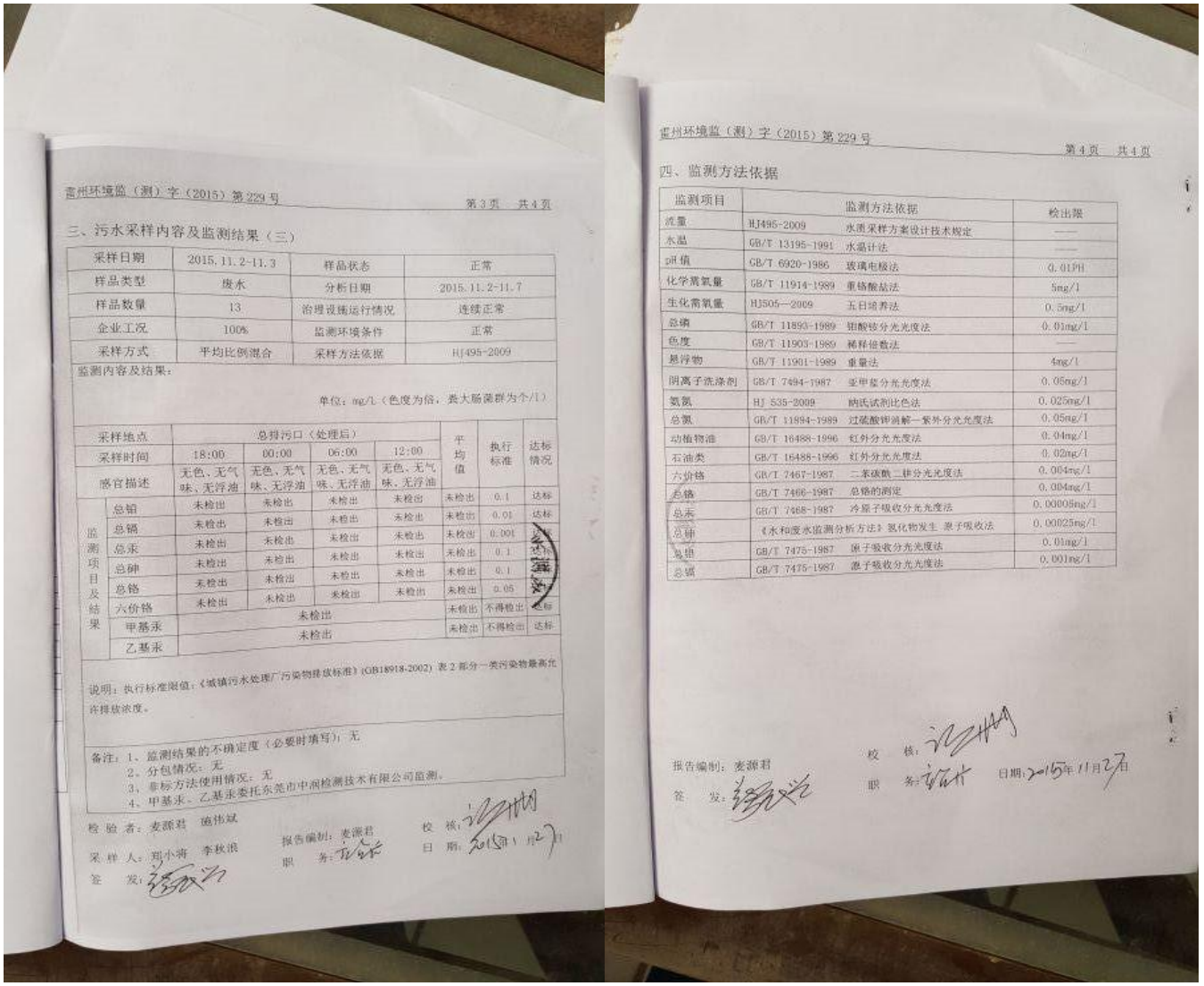
说明：执行标准限值：《城镇污水处理厂污染物排放标准》（GB18918-2002）表1一级标准B标准。

备注：1、监测结果的不确定度（必要时填写）：无
2、分包情况：粪大肠菌群项目分包于深圳市索奥检测技术有限公司。
3、非标方法使用情况：无
4、粪大肠菌群委托东莞市中润检测技术有限公司监测。

检验者：蔡武兴 黄孟 许润 麦源君 曾玉洁 陈丽丽 陈迎冰 陈壮 施伟斌 柯杏权

采样人：郑小将 李秋浪 报告编制：麦源君 校 核：

签 发： 职 务： 日 期：2015年11月27日



惠州环境监（测）字（2015）第229号 第3页 共4页

三、污水采样内容及监测结果（三）

采样日期	2015.11.2-11.3	样品状态	正常
样品类型	废水	分析日期	2015.11.2-11.7
样品数量	13	治理设施运行情况	连续正常
企业工况	100%	监测环境条件	正常
采样方式	平均比例混合	采样方法依据	HJ495-2009

监测内容及结果：

单位：mg/L（色度为倍，粪大肠菌群为个/l）

采样地点		总排污口（处理后）				平均值	执行标准	达标情况
采样时间		18:00	00:00	06:00	12:00			
感官描述		无色、无气味、无浮油	无色、无气味、无浮油	无色、无气味、无浮油	无色、无气味、无浮油			
监测项目及结果	总铅	未检出	未检出	未检出	未检出	未检出	0.1	达标
	总镉	未检出	未检出	未检出	未检出	未检出	0.01	达标
	总汞	未检出	未检出	未检出	未检出	未检出	0.001	达标
	总砷	未检出	未检出	未检出	未检出	未检出	0.1	达标
	总铬	未检出	未检出	未检出	未检出	未检出	0.1	达标
	六价铬	未检出	未检出	未检出	未检出	未检出	0.05	达标
	甲基汞	未检出				未检出	不得检出	达标
	乙基汞	未检出				未检出	不得检出	达标

说明：执行标准限值：《城镇污水处理厂污染物排放标准》(GB18918-2002) 表2 部分一类污染物最高允许排放浓度。

备注：1、监测结果的不确定度（必要时填写）：无
2、分包情况：无
3、非标方法使用情况：无
4、甲基汞、乙基汞委托东莞市中润检测技术有限公司监测。

检验者：麦源君 施伟斌

采样人：郑小将 李秋报

签发：

报告编制：麦源君

职务：

校核：

日期：2015.11.27

惠州环境监（测）字（2015）第229号 第4页 共4页

四、监测方法依据

监测项目	监测方法依据		检出限
流量	HJ495-2009	水质采样方案设计技术规定	——
水温	GB/T 13195-1991	水温计法	——
pH值	GB/T 6920-1986	玻璃电极法	0.01PH
化学需氧量	GB/T 11914-1989	重铬酸盐法	5mg/l
生化需氧量	HJ505—2009	五日培养法	0.5mg/l
总磷	GB/T 11893-1989	钼酸铵分光光度法	0.01mg/l
色度	GB/T 11903-1989	稀释倍数法	——
悬浮物	GB/T 11901-1989	重量法	4mg/l
阴离子洗涤剂	GB/T 7494-1987	亚甲蓝分光光度法	0.05mg/l
氨氮	HJ 535-2009	纳氏试剂比色法	0.025mg/l
总氮	GB/T 11894-1989	过硫酸钾消解—紫外分光光度法	0.05mg/l
动植物油	GB/T 16488-1996	红外分光光度法	0.04mg/l
石油类	GB/T 16488-1996	红外分光光度法	0.02mg/l
六价铬	GB/T 7467-1987	二苯碳酰二肼分光光度法	0.004mg/l
总铬	GB/T 7466-1987	总铬的测定	0.004mg/l
总汞	GB/T 7468-1987	冷原子吸收分光光度法	0.00005mg/l
总砷	《水和废水监测分析方法》氢化物发生 原子吸收法		0.00025mg/l
总铅	GB/T 7475-1987	原子吸收分光光度法	0.01mg/l
总镉	GB/T 7475-1987	原子吸收分光光度法	0.001mg/l

报告编制：麦源君

签发：

校核：

职务：

日期：2015年11月27日

Annex 5 Luoding Wastewater Treatment Plant Water Quality Monitoring Data

2015	Amount of Water（10,000 tons）	Operation days	Month average daily water (10,000 tons/day)	COD in Factory（mg/L）		Ammonia Nitrogen in Factory（mg/L）		Monitoring Dates	COD in Monitoring Station（mg/L）		Ammonia Nitrogen in Monitoring Station（mg/L）	
				Influent	Effluent	Influent	Effluent		Influent	Effluent	Influent	Effluent
January	55.6755	31	1.80	164	20.6	15.2	0.97	4th, Jan	175	30.1	17.4	1.84
								19th, Jan	191	32.6	15.5	1.58
								Average	183	31.4	16.4	1.71
February	53.1895	28	1.90	166	27.2	15.5	1	2nd, Feb	182	33.4	17.3	1.79
								15th, Feb	183	33.2	15.5	1.53
								Average	182	33.3	16.4	1.66
March	54.4558	31	1.76	157	21.5	15	1.18	4th, Mar	178	31.6	15.2	1.83
								17th, Mar	176	32	15.6	1.68
								Average	177	31.8	15.4	1.76
April	50.1407	30	1.67	161	23.1	16.2	0.86	7th, Apr	178	30.2	15.4	1.48
								20th, Apr	176	30	15.5	1.58
								Average	177	30.1	15.4	1.53
May	57.972	31	1.87	148	23.5	15.5	0.79	18th, May	176	32.2	15.5	1.03
								28th, May	176	31.6	16.4	1.18
								Average	176	31.9	16	1.11
June	62.1306	30	2.07	157	23.1	16	0.69	17th, Jun	174	31.4	16.3	1.05
								30th, Jun	176	32.6	14.3	0.982
								Average	175	32	16	1.02
July	62.9624	31	2.03	159	21.6	16.1	0.47	9th, Jul	147	23.3	13.9	0.948
								29th, Jul	160	25.9	14.8	1.49
								Average	154	24.6	14.4	1.22
August	51.2851	31	1.65	160	25.8	16.2	0.45	3rd, Aug	173	25.6	15.3	0.96
								20th, Aug	175	26.8	14.1	1.05
								Average	174	26.2	14.7	1
September	38.8347	30	1.29	160	21.8	15.4	0.57	9 月 8 日	174	34.2	12.1	1.2
								9 月 28 日	176	34.2	12.3	1.31
								Average	175	34.2	12.2	1.26
October	53.852	31	1.74	157	22.3	15.6	0.63	8th, Oct	172	24.6	12.5	1.33
								26th, Oct	170	24.3	12.3	1.15
								Average	171	24.4	12.4	1.24
November	49.2469	30	1.64	159	22	16	0.56	7th, Nov	172	24.7	17.4	1.19
								27th, Nov	168	24.3	15.1	0.89
								Average	170	24.5	16.2	1.04
December	62.6457	31	2.02	160	21.6	15.9	0.65	11th, Dec	165	24	16.9	0.79
								22nd, Dec	164	23.8	15.8	1.17
								Average	164	23.9	16.4	0.98
Total	652.3909	365	1.79	159.00	22.84	15.72	0.74		173	29.0	15.2	1.29

Annex 6 Suixi County Wastewater Treatment Plant Water Quality Monitoring Data

遂环监（测）字（2015）第S06号　　第2页共2页

2、分析方法及环境条件

监测项目	方法依据	最低检出限（mg/L）	分析仪器型号	检测环境条件		备注
				温度℃	相对湿度%	
PH值	GB/T6920-1986	/	PHSJ-3F型	19	58	
色度	GB/T11903-1989	/	稀释倍数法	/	/	
化学需氧量	快速密闭催化消解法《水和废水监测分析方法》第四版	2	WMX-IIIA型	/	/	
五日生化需氧量	HJ505-2009	0.5	PYX-250S-A	/	/	
氨氮	HJ535-2009	0.025	723型	20	62	
总磷	GB/T11893-1989	0.01	721型	20	62	
总氮	HJ636-2012	0.05	751型	20	70	
总铬	GB/T7466-1987	0.004	723型	19	74	
铬（六价）	GB/T7467-1987	0.004	721型	19	74	
总砷	原子荧光法《水和废水监测分析方法》第四版	0.0002	AFS-9130	18	60	
总镉	GB/T7475-1987	0.001	WFX-130	19	66	
总铅	GB/T7475-1987	0.01	WFX-130	19	66	
石油类	HJ637-2012	0.04	IR-200A	19	74	
阴离子表面活性剂	GB/T7494-1987	0.05	721型	19	63	
动植物油	HJ637-2012	0.04	IR-200A	19	74	
悬浮物	GB/T11901-1989	4	AUY220	19	57	
粪大肠菌群	HJ/T347－2007	20	/	/	/	
总汞	原子荧光法《水和废水监测分析方法》第四版	0.00005	AFS-9130	18	60	
流量	HJ/T91-2002	/	SGM/KL-DCB	/	/	

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：

签发日期：2015年1月12日

遂环监（测）字（2015）第S06号　　第1页共2页

1、监测内容及结果

单位名称	遂溪县广业环保有限公司	地址	遂城镇
采样日期	2015.1.6	样品特性	废水
样品状态	完整	分析日期	2015.1.6－1.11
方法依据	HJ/T91-2002	流量计编号	2005352
天气状况	晴	治理设施运行情况	运行
采样方式	连续比例混合	采样人	陈文、王海斌
分析人员	曹东华、麦土妹、卜小红、黄华珠、黄一冰		

监测结果：

单位：mg/L（PH值除外）

监测项目	处理前入口(均值)	WS-50006 处理后出口(均值)	执行标准(GB18918-2002)一级B标准	WS-50006 处理后出口达标情况
PH值	6.78	7.14	6~9	达标
化学需氧量	106	22.1	60	达标
五日生化需氧量	67.8	8.1	20	达标
氨氮	10.66	4.048	8	达标
悬浮物	91	12	20	达标
石油类	1.04	0.01L	3	达标
色度	28	9	30	达标
总磷	2.32	0.477	1	达标
总氮	19.1	7.18	20	达标
动植物油	6.22	2.11	3	达标
铬(六价)	0.004L	0.004L	0.05	达标
阴离子表面活性剂	1.59	0.25	1	达标
总铬	0.004L	0.004L	0.1	达标
总砷	0.0002L	0.0002L	0.1	达标
总铅	0.01L	0.01L	0.1	达标
总镉	0.01L	0.001L	0.01	达标
总汞	0.00005L	0.00005L	0.001	达标
粪大肠菌群	12600	3825	10000	达标
流量（m^3/h）	/	1026.14	/	

备注：1、分包情况：粪大肠菌群分包湛江市环境保护监测站分析。
2、非标准方法使用情况：无

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：　　签发日期：2015年1月14日

遂环监（测）字（2015）第S31号　　第2页共2页

2、分析方法及环境条件

监测项目	方法依据	最低检出限（mg/L）	分析仪器型号	检测环境条件		备注
				温度℃	相对湿度%	
PH值	GB/T6920-1986	/	PHSJ-3F型	24	61	
色度	GB/T11903-1989	/	稀释倍数法	/	/	
化学需氧量	快速密闭催化消解法《水和废水监测分析方法》第四版	2	WMX-IIIA型	/	/	
五日生化需氧量	HJ505-2009	0.5	PYX-250S-A	/	/	
氨氮	HJ535-2009	0.025	723型	23	57	
总磷	GB/T11893-1989	0.01	721型	23	60	
总氮	HJ636-2012	0.05	751型	23	57	
总铬	GB/T7466-1987	0.004	723型	24	60	
铬（六价）	GB/T7467-1987	0.004	721型	23	53	
总砷	原子荧光法《水和废水监测分析方法》第四版	0.0002	AFS-9130	24	60	
总镉	GB/T7475-1987	0.001	A3AFG-12	23	66	
总铅	GB/T7475-1987	0.01	A3AFG-12	23	66	
石油类	HJ637-2012	0.04	IR-200A	23	53	
阴离子表面活性剂	GB/T7494-1987	0.05	721型	25	54	
动植物油	HJ637-2012	0.04	IR-200A	23	53	
悬浮物	GB/T11901-1989	4	AUY220	20	60	
粪大肠菌群	HJ/T347－2007	20	/	/	/	
总汞	原子荧光法《水和废水监测分析方法》第四版	0.00005	AFS-9130	24	60	
流量	HJ/T91-2002	/	SGM/KL-DCB	/	/	

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：

签发日期：2015年 6月 20日

遂环监（测）字（2015）第S31号　　第1页共2页

1、监测内容及结果

单位名称	遂溪县广业环保有限公司	地址	遂城镇
采样日期	2015.4.13	样品特性	废水
样品状态	完整	分析日期	2015.4.13－4.18
方法依据	HJ/T91-2002	流量计编号	2005352
天气状况	晴	治理设施运行情况	运行
采样方式	连续比例混合	采样人	陈文、陈立权
分析人员	曹东华、麦土妹、卜小红、黄华珠、黄一冰		

监测结果：

单位：mg/L（PH值除外）

监测项目	处理前(均值)	WS-50006处理后(均值)	执行标准(GB18918-2002)一级B标准	WS-50006处理后达标情况
PH值	6.48	7.07	6~9	达标
化学需氧量	155	21.5	60	达标
五日生化需氧量	93	7.7	20	达标
氨氮	7.103	2.179	8	达标
悬浮物	98	9	20	达标
石油类	0.90	0.30	3	达标
色度	18	7	30	达标
总磷	2.25	0.712	1	达标
总氮	12.7	3.90	20	达标
动植物油	6.44	2.96	3	达标
铬(六价)	未检出	未检出	0.05	达标
阴离子表面活性剂	1.08	0.20	1	达标
总铬	未检出	未检出	0.1	达标
总砷	未检出	未检出	0.1	达标
总铅	未检出	未检出	0.1	达标
总镉	未检出	未检出	0.01	达标
总汞	未检出	未检出	0.001	达标
粪大肠菌群	99500	未检出	10000	达标
流量（m^3/h）	/	1057.36	/	

备注：1、分包情况：粪大肠菌群分包湛江市环境保护监测站分析。
2、非标准方法使用情况：无

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：　　签发日期：2015年4月20日

遂环监（测）字（2015）第S34号 第2页共2页

2、分析方法及环境条件

监测项目	方法依据	最低检出限（mg/L）	分析仪器型号	检测环境条件		备注
				温度℃	相对湿度%	
PH值	GB/T6920-1986	/	PHSJ-3F型	28	69	
色度	GB/T11903-1989	/	稀释倍数法	/	/	
化学需氧量	快速密闭催化消解法《水和废水监测分析方法》第四版	2	WMX-IIIA型	/	/	
五日生化需氧量	HJ505-2009	0.5	PYX-250S-A	/	/	
氨氮	HJ535-2009	0.025	723型	28	68	
总磷	GB/T11893-1989	0.01	721型	28	66	
总氮	HJ636-2012	0.05	TU-1810PC	28	68	
总铬	GB/T7466-1987	0.004	723型	28	60	
铬（六价）	GB/T7466-1987	0.004	723型	29	51	
总砷	HJ694-2014	0.3ug/L	AFS-9130	28	64	
总镉	GB/T7475-1987	0.001	A3AFG-12	28	68	
总铅	GB/T7475-1987	0.01	A3AFG-12	28	68	
石油类	HJ637-2012	0.04	IR-200A	28	64	
阴离子表面活性剂	GB/T7494-1987	0.05	721型	28	61	
动植物油	HJ637-2012	0.04	IR-200A	28	64	
悬浮物	GB/T11901-1989	4	AUY220	19	56	
粪大肠菌群	HJ/T347－2007	20	/	/	/	
总汞	HJ694-2014	0.04ug/L	AFS-9130	28	64	
流量	HJ/T91-2002	/	SGM/KL-DCB	/	/	

编制者：李红梅 审核签发者（站长、技术负责人）：

复核者： 签发日期：2015年7月22日

遂环监（测）字（2015）第S37号　　第1页共2页

1、监测内容及结果

单位名称	遂溪县广业环保有限公司	地址	遂城镇
采样日期	2015.10.28	样品特性	废水
样品状态	完整	分析日期	2015.10.28—11.2
方法依据	HJ/T91-2002	流量计编号	021
天气状况	晴	治理设施运行情况	运行
采样方式	连续比例混合	采样人	王海斌、陈文
分析人员	曹东华、麦土妹、卜小红、黄华珠、黄一冰、杨贻薇、谢舜子		

监测结果：

单位：mg/L（PH值除外）

监测项目		处理前(均值)	WS-50006处理后(均值)	执行标准(GB18918-2002)一级B标准	WS-50006处理后达标情况
PH值		6.46	7.00	6~9	达标
化学需氧量		146	22.4	60	达标
五日生化需氧量		108	8.4	20	达标
氨氮		12.4	5.31	8	达标
悬浮物		92	15	20	达标
石油类		0.56	0.10	3	达标
色度		28	10	30	达标
总磷		2.57	0.688	1	达标
总氮		11.4	9.59	20	达标
动植物油		7.22	1.89	3	达标
铬(六价)		未检出	未检出	0.05	达标
阴离子表面活性剂		1.04	0.12	1	达标
总铬		未检出	未检出	0.1	达标
总砷		未检出	未检出	0.1	达标
总铅		未检出	未检出	0.1	达标
总镉		未检出	未检出	0.01	达标
总汞		未检出	未检出	0.001	达标
粪大肠菌群		105300	2308	10000	达标
烷基汞	甲基汞	/	未检出	不得检出	达标
	乙基汞	/	未检出		
流量（m^3/h）		/	1068.25	/	/

备注：1、分包情况：粪大肠菌群分包湛江市环境保护监测站分析；甲基汞、乙基汞由企业自行委托深圳市威标检测技术有限公司检测。

2、非标准方法使用情况：无

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：　　签发日期：2015年11月3日

遂环监（测）字（2015）第S37号　　第2页共2页

2、分析方法及环境条件

监测项目	方法依据	最低检出限（mg/L）	分析仪器型号	检测环境条件		备注
				温度℃	相对湿度%	
PH值	GB/T6920-1986	/	PHSJ-3F型	26	58	
色度	GB/T11903-1989	/	稀释倍数法	/	/	
化学需氧量	快速密闭催化消解法《水和废水监测分析方法》第四版	2	WMX-IIIA型	/	/	
五日生化需氧量	HJ505-2009	0.5	PYX-250S-A	/	/	
氨氮	HJ535-2009	0.025	723型	28	74	
总磷	GB/T11893-1989	0.01	721型	26	60	
总氮	HJ636-2012	0.05	TU-1810PC	27	64	
总铬	GB/T7466-1987	0.004	723型	28	74	
铬（六价）	GB/T7466-1987	0.004	721型	28	74	
总砷	HJ694-2014	0.3ug/L	AFS-9130	25	58	
总镉	GB/T7475-1987	0.001	A3AFG-12	25	58	
总铅	GB/T7475-1987	0.01	A3AFG-12	25	60	
石油类	HJ637-2012	0.04	IR-200A	27	62	
阴离子表面活性剂	GB/T7494-1987	0.05	721型	25	65	
动植物油	HJ637-2012	0.04	IR-200A	27	62	
悬浮物	GB/T11901-1989	4	AUY220	20	55	
粪大肠菌群	HJ/T347—2007	20	/	/	/	
总汞	HJ694-2014	0.04ug/L	AFS-9130	25	58	
甲基汞	GB/T14204-1993	0.00001	GC7890B气相色谱仪	/	/	
乙基汞	GB/T14204-1993	0.00002		/	/	
流量	HJ/T91-2002	/	SGM/KL-DCB	/	/	

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：　　签发日期：2015年11月3日

遂环监（测）字（2015）第S34号　　第1页共2页

1、监测内容及结果

单位名称	遂溪县广业环保有限公司	地址	遂城镇
采样日期	2015.7.16	样品特性	废水
样品状态	完整	分析日期	2015.7.16—7.21
方法依据	HJ/T91-2002	流量计编号	021
天气状况	晴	治理设施运行情况	运行
采样方式	连续比例混合	采样人	王海斌、麦海峰
分析人员	曹东华、麦土妹、卜小红、黄华珠、黄一冰		

监测结果：

单位：mg/L（PH值除外）

监测项目	处理前(均值)	WS-50006处理后(均值)	执行标准(GB18918-2002)一级B标准	WS-50006处理后达标情况
PH值	6.46	6.40	6~9	达标
化学需氧量	131	23.2	60	达标
五日生化需氧量	74.6	7.7	20	达标
氨氮	6.332	1.342	8	达标
悬浮物	106	9	20	达标
石油类	0.38	0.09	3	达标
色度	14	6	30	达标
总磷	2.28	0.580	1	达标
总氮	11.4	2.39	20	达标
动植物油	6.90	1.89	3	达标
铬(六价)	未检出	未检出	0.05	达标
阴离子表面活性剂	1.48	0.13	1	达标
总铬	未检出	未检出	0.1	达标
总砷	未检出	未检出	0.1	达标
总铅	未检出	未检出	0.1	达标
总镉	未检出	未检出	0.01	达标
总汞	未检出	未检出	0.001	达标
粪大肠菌群	22500	未检出	10000	达标
流量（m^3/h）	/	1077.88	/	

备注：1、分包情况：粪大肠菌群分包湛江市环境保护监测站分析。
2、非标准方法使用情况：无

编制者：李红梅　　审核签发者（站长、技术负责人）：

复核者：　　签发日期：2015年7月22日

Annex 7 Wengyuan County Wastewater Treatment Plant Water Quality Monitoring Data

翁源县清源污水处理厂2015年监测指标数据										
月份	COD（mg/L）		氨氮（mg/L）		悬浮物（mg/L）		总磷（mg/L）		五日生化需氧量（mg/L）	
	进水	出水	进水	出水	进水	出水	进水	出水	进水	出水
1	94.5	25.6	11.9	4.13	60	13	0.97	0.32	36.6	12.4
2	94.5	25.6	13.1	5.09	61	14	0.93	0.31	39.1	13.7
3	89.3	23.8	12.6	5.05	42	13	0.87	0.36	22.7	9.5
4	90.5	21.6	11.9	4.45	61	11	0.93	0.31	30.5	10.3
5	88.6	23.6	11.4	4.18	64	12	0.94	0.30	34.6	11.0
6	90.9	23.7	12.4	3.89	65	13	0.97	0.31	37.0	10.5
7	87.6	23.9	12.4	4.38	62	9	0.96	0.31	40.7	12.0
8	91.3	23.8	12.5	4.00	63	10	0.95	0.33	36.1	12.1
9	93.6	21.9	12.8	2.53	61	11	0.97	0.34	40.6	12.4
10	95.2	23.8	12.1	3.42	65	13	0.94	0.31	28.9	8.1
11	95.6	24.6	12.3	3.45	63	12	0.99	0.33	38.6	11.8
12	96.4	23.6	12.9	3.52	63	13	1.00	0.34	38.6	13.4

Annex 8 Wuchuan Wastewater Treatment Plant Water Quality Monitoring Data

Wuchuan Wastewater Treatment Plant Self-monitor Annual Report

Monitoring Date: 1st, Jan, 2015

Reporting Date: 7th, Jan, 2016

1. Adjustment of Self-Monitoring Programs

Wuchuan Wastewater treatment plant 2015 self-monitoring program release and execute on December 30, 2013. Due to adjust self-monitoring items, Wuchuan Wastewater treatment plant released a new self-monitoring program on October 30th, 2015, and the new self-monitoring program execute on November 1st, 2015.

2. Self-monitoring Results of 2015

2015 self-monitoring results of statistics in Table 1.

Table 1 self-monitoring results of 2015

Basic Information					
Annual production days: 365 days		Monitoring days: 365 days			
Self-monitoring results					
Types	Monitoring Points	Monitoring Factors	Annual Monitoring Frequency	Compliance Times	Maximum Value Exceeded
Waste water	Plant Total Outfall	PH	12	12	
		BOD_5	3	3	
		Total Phosphorus	12	12	
		COD	365	365	
		Chromaticity	3	3	
		Total Mercury	2	2	
		Alkyl Mercury	2	2	
		Total Cadmium	2	2	
		Total Chromium	2	2	
		Hexavalent	2	2	

		Chromium			
		Total Arsenic	2	2	
		Total Lead	2	2	
		Suspended Solids	12	12	
		Anionic Surfactants （LAS）	2	2	
		Fecal Coliforms	3	3	
		Ammonia Nitrogen	365	365	
		Total Nitrogen	3	3	
		Oil Pollutants	2	2	
		Animal and Vegetable Oils	2	2	
Plant Boundary Noise	East of Plant Boundary	Noise	4	4	
	South of Plant Boundary	Noise	4	4	
	West of Plant Boundary	Noise	4	4	
	North of Plant Boundary	Noise	4	4	

3、Annual Amount of Wastewater, Waste gas Pollutant Emissions

According to the 2015 self-monitoring data, the whole amount of plant pollutant emissions in 2015 are shown in Table 2。

Table 2 2015 Pollutant Emissions Statistics

Types	Names of Pollutants	Annual Emissions
Wastewater	BOD_5	67.43 tons
	Total Phosphorus	9.54 tons
	COD	221.03 tons
	Total Mercury	0 ton
	Alkyl Mercury	0 ton
	Total Cadmium	0 ton
	Total Chromium	0 ton
	Hexavalent Chromium	0 ton
	Total Arsenic	0.01ton
	Total Lead	0 ton
	Suspended solids	105.29 tons
	Anionic surfactants（LAS）	0 ton
	Fecal Coliforms	4176 units
	Ammonia Nitrogen	11.24 ton
	Total Nitrogen	112.37 ton
	Oil Pollutants	0.51 ton
	Animals and Vegetable Oils	0.26 ton

4、Solid Waste Statistics

2015 The company solid waste statistics in Table 3.

Table 3 2015 Solid Waste Statistics

Types of Solid Waste	Names of Solid Waste	Amount of Produced	Treatment	Whereabouts
Others	Sludge	3787 tons	Ingredient for fertilizer production	disposed by qualified company (Zhanjiang Xiashan

				District Xi Ming Environmental Construction Materials Co., Ltd)

January, 7th, 2016