Draft Initial Environmental Examination

Project Number: 54118-001
May 2022

People's Republic of China: Strengthening Public Health Institutions Building Project

Prepared by the Project Management Office of the Executing Agencies for the Asian Development Bank.

CURRENCY EQUIVALENTS
(as of 2 May 2022)

Currency unit – yuan (CNY)
CNY1.00 = $0.1513
$1.00 = CNY6.6085

ABBREVIATIONS

ADB	–	Asian Development Bank
BOD5	-	5-day biochemical oxygen demand
COD	-	chemical oxygen demand
COVID-19	-	corona virus disease 19
CNY	-	Chinese yuan
CSF	-	construction supervision firm
EEB	-	ecology and environment bureau
EEM	-	external environment monitor
EHS	-	environment, health, and safety
EIA	-	environmental impact assessment
EMP	-	environmental management plan
EMS	-	environmental monitoring station
FSR	-	feasibility study report
GHG	-	greenhouse gas
GRM	-	grievance redress mechanism
IEE	-	initial environmental examination
LDI	-	local design institute
LIEC	-	loan implementation environmental consultant
L_{Aeq}	-	equivalent continuous A-weighted sound pressure level
NDRC	-	National Development and Reform Commission
MEE	-	Ministry of Ecology and Environment
O&M	-	operation and maintenance
PCC	-	public complaint center
PM	-	particulate matter
PRC	-	People's Republic of China
SPS	-	Safeguard Policy Statement
SS	-	suspended solids
TEIA	-	tabular environmental impact assessment
TRTA	-	transaction technical assistance
TSP	-	total suspended particulate
VOC	-	volatile organic compound
WBG	-	World Bank Group
WHO	-	World Health Organization
WWTP	-	wastewater treatment plant

WEIGHTS AND MEASURES

°C	–	degree centigrade
dB	–	decibel
kg/d	–	kilogram per day
km	–	kilometer
km^2	–	square kilometer
kW	–	kilowatt
m	–	meter
mu	–	1/15 hectare
m^2	–	square meter
m^3	–	cubic meter
m^3/a	–	cubic meter per annum
m^3/d	–	cubic meter per day
mg/l	–	milligram per liter
mg/m^3	–	milligram per cubic meter
t	–	metric ton
t/a	–	ton per annum
t/d	–	ton per day
time/h	–	time per hour

NOTE

In this report, "$" refers to United States dollars.

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PRC (54118-001):Strengthening Public Health Institutions Building Project
加强公共卫生机构建设项目
— Endorsement of the draft Initial Environmental Examination and Environmental Management Plan
《初步环境影响评估》和《环境管理计划承诺函》

Dear Mr. Najibullah Habib,
尊敬的 Najib 先生：

This is to advise you that there is no objection to these draft documents being posted on the Asian Development Bank (ADB) public website, following ADB's standard procedures. The Government agrees to implement the final draft IEE and EMP and accepts the coordination and inspection of ADB. In case any public comments are received which affect the content of the IEE and/or EMP, or for any questions the Government has on the draft documents, the Government and ADB will review these together to agree on actions to be taken.

谨此通知您，我们同意按照亚行的标准流程，在亚行网站上公示《初步环境影响评估》和《环境管理计划》草案，并承诺按照《环境管理计划》的要求实施，接受亚行的监督。实施过程中收到任何公众反馈意见或有任何问题，与亚行商讨解决。

Yours sincerely,
此致

Fangchenggang City Culture and Tourism Group Co., Ltd.
防城港市文旅集团有限公司
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May 2022
2022 年 5 月

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Yours sincerely,
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May 2022
2022 年 5 月

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Yours sincerely,
此致

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May 2022
2022 年 5 月

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EXECUTIVE SUMMARY

A. Background

1. This initial environmental examination (IEE) report including an environmental management plan (EMP), has been prepared for the proposed Strengthening Public Health Institutions Building Project (hereafter referred to as the project) in the People's Republic of China (PRC). The project IEE is prepared in accordance with the requirements of Asian Development Bank's (ADB's) Safeguard Policy Statement (SPS 2009) on the basis of the domestic environmental impact assessment (EIA) reports, feasibility study reports (FSRs), as well as results of site investigations and discussions with various stakeholders during environmental due diligence.

B. Project Design

2. The proposed project introduces a transformational approach to address gaps by strengthening public health institutional capacity in the PRC. The project will support the PRC in implementing its Healthy China 2030 to improve the quality and services of the health care system; and its Fourteenth Five-Year Plan, 2021−2025 by implementing health system strengthening. The government of PRC has requested financial assistance from to help finance the project.

3. The project is aligned with the following impact: (i) health and well-being of residents protected, promoted, and restored; (ii) capacity for early warning, risk reduction, and management of health security risks strengthened); and (iii) prevention and control of major communicable diseases strengthened. The project will have the following outcome: capacity and provision of public health services in the project areas improved. The project will deliver three outputs as Output 1: Public health institutional capacity and policies developed; Output 2: Effective public health ecosystem established; and Output 3: Training excellence and international cooperation capability enhanced. The project will be implemented from September 2022–December 2027. The executing agencies of the project will be (i) Fangchenggang Municipal People's Government, (ii) Guiyang Municipal People's Government, and (iii) Shaanxi Provincial Government. The project implementing agencies will be (i) Fangchenggang City Culture and Tourism Group Co. Ltd., (ii) Guiyang City Sanitation and Health Bureau, and (iii) Yan'an University Affiliated Hospital (Shaanxi Province). The government of PRC has requested financial assistance from to help finance the project.

4. The project will support construction of physical infrastructure facilities such as buildings, training centers and installation of associated facilities and equipment. The project consists of three sites located in three cities: (i) Fangchenggang City, GZAR; (ii) Guiyang City, Guizhou Province; and (iii) Yan'an City, Shaanxi Province. One new health facility will be established per project site to support health security needs. In Fangchenggang the project will construct a Special Medical Technology Building, construct a Chinese Medicine Infectious Disease Control Center, training base construction, purchase and install the medical equipment. The project facilities will occupy a land area of 136,026 m^2. In Guiyang the project will construct a hospital of traditional Chinese medicine with a total capacity of 800 beds (first phase of 500 beds and second phase 300 beds), medical technology, health center and other medical facilities, and training rooms. The project facilities will occupy a land area of 136,026 m^2. In Yan'an the project will construct a women and children's branch hospital, purchase and install the medical equipment, upgrading of existing ward building, construction of training center. The project facilities will occupy an area of 32,138.15 m^2 (48.21 mu) of state-owned land, with a total construction area of

110,752.36 m^2, including 86,442.35 m^2 above ground and 24,310.01 m^2 underground. These project facilities are located in Yan'an city of Shaanxi Province; Guiyang city of Guizhou Province; and Fangchenggang city is Guangxi Zhuang Autonomous Region of PRC.

5. The project sites in three cities are not located in or around any environmentally sensitive areas. The sites have been selected with due considerations to the environmental sensitivity

6. The project underwent appraisal during project preparation and was classified as category B based on comprehensive site visits and ADB's Rapid Environmental Assessment Checklist. Domestically, the Guiyang TCMH and Yan'an University Affiliated Hospital are classified as category A, requiring full EIA reports. Fangchenggang TCMH is domestically classified as category B, requiring a tabular EIA. The domestic environmental assessment documents (EIAs for Guiyang and Yan'an, and EIT for Fangchenggang) have been prepared and the same will be submitted to the ecology and environment bureaus of the project cities for approval.

C. Anticipated Environmental Impacts and Mitigation Measures

7. During construction, major anticipated impacts from project activities include (i) dust, noise, and soil runoff during construction; (ii) temporary traffic disturbances because of transportation of construction materials; (iii) risks to community and workers' health and safety during construction; and (iv) wastewater and solid waste generated during construction. Overall, construction-related impacts are localized, short-term, and can be effectively mitigated through the application of good construction and housekeeping practices and implementation of construction phase community and occupational health and safety plans as defined in the EMP.

8. During operation, the major negative environmental impacts are related to storage, transportation and disposal of medical waste, and treatment of medical wastewater. The medical waste will be disposed by the existing medical waste treatment centers. Due diligence confirmed that these facilities are established and operated in accordance with the PRC environmental regulations. Other environmental impacts are anticipated to be minor and will be addressed through conventional operation and maintenance practices, health and safety codes and measures included in the operations aspects of the EMP.

9. Environmental risks and the assurances required to address these risks have been identified in this IEE. The majority of environmental risks are related to design features and operational plans which will avoid or mitigate impacts, but which rely on the implementers' commitment and capacity to implement and consistently follow-up.

D. Environmental Management Plan

10. An EMP has been developed for the design and pre-construction, construction, and operation phases of the project. The EMP sets out (i) actions to implement mitigation measures; (ii) a monitoring and reporting program; (iii) institutional/organizational arrangements; (iv) capacity development and training; (v) an implementation schedule; and (vi) cost estimates. The total estimated cost of the EMP implementation is about $7.7 million. Under the supervision of PMOs, the implementing agencies will ensure that such funds are made available in a timely manner. The final EMP forms part of the project administration manual (PAM) and will be included as a separate annex in all bidding documents. The contractors will be made aware of their obligations to implement the EMP, to budget EMP implementation costs in their bids, and to develop site-EMP fully responsive to the project EMP.

E. Information Discloser, Consultations, and Grievance Redress Mechanism

11. In the framework of the environmental due diligence, information disclosure and consultations (public and stakeholder) meetings were held between August 2021 to March 2022.

12. Two rounds of information disclosure for the subprojects in three project cities were conducted by the EIA institutes and implementing agencies during August 2021 to March 2022 through websites, newspaper, and community poster.

13. Site-specific consultation programs were conducted near the project sites in three cities. For Guiyang subproject, total of 17 residents in Mainai village were interviewed by the EIA institute in March 2022, including 8 females and 9 males. For Yan'an, public consultation workshop was organized by the implementing agency and EIA institute on March 31, 2022. Total of 15 residents from Yangjiawa village and Yan'an University attended the workshop. For Fangchenggang, the access to the standard form of public comments developed by MEE was provided on the website of implementing agency during the two rounds of information disclosure in March 2022. This comprehensive consultation indicated that the majority of the affected people had a positive attitude toward the project and believed it would benefit them in the long-term through better health care facilities. Each project city will establish and maintain a project-specific grievance redress mechanism (GRM) to address public complaints related to project activities during project implementation and operation. There will be three independent safeguards grievance redress mechanisms jointly for environmental and social safeguards. Consultation and participation will continue throughout project implementation and any environmental complaints or disputes will be handled in accordance with the GRM.

F. Conclusion

14. The project IEE concludes that if the measures prescribed in the EMP are fully implemented, it is unlikely that the project will have significant adverse environment, health, and safety impacts. Environmental management and monitoring plans have been prepared, with budgets and responsibilities for implementation assigned. The EMP will be updated based on final design and will be submitted to ADB for review and approval prior to the commencement of the civil works. Contractors during construction, and facility operators as well as executing agencies during operation will implement these measures. The effectiveness of these measures will be regularly evaluated in the framework of the environmental monitoring program, and corrective actions defined as required.

I. INTRODUCTION

15. This initial environmental examination (IEE) has been carried out to identify and assess the potential environmental risks and impacts of the physical infrastructure components proposed under Strengthening Public Health Institutions Building Project (hereafter referred to as the project) in the People's Republic of China (PRC). This IEE has been conducted to meet the Asian Development Bank's (ADB) Safeguard Policy Statement (SPS 2009) requirements for financing the project.

A. Background and Rationale

16. The PRC has experienced rapid economic growth in the past 4 decades. The PRC's gross domestic product (GDP) reached $14.7 trillion in 2020, accounting for 17.4% of the global total compared with just 1.7% in 1978. In 2020, the PRC announced having lifted almost 800 million out of poverty since its reforms starting in 1978. Economic growth allowed investments in the health sector that resulted in high universal health coverage, improved access, reduced child and maternal mortality, lower incidence of infectious disease, and higher life expectancy. The Healthy China 2030 plan established in 2016, identifies health as a fundamental prerequisite for social and economic development.[1] It focuses on disease prevention as well as a holistic well-being approach with core indicators including strengthening health security and improving health services.[2] Healthy China 2030 is in line with the health reforms under the PRC's Fourteenth Five-Year Plan, 2021–2025, which prioritizes health system development.[3]

17. While health system development has progressed, the PRC is now faced with increasingly complex health challenges. Despite the relatively advanced development of the PRC's health system, the COVID-19 pandemic highlights obstacles and development needs in the government-led public health system. The quality of service from health care providers is inadequate, and education and qualification levels among professionals in public health are low (footnote 1). The COVID-19 pandemic showed that hospitals are particularly vulnerable to surges in admissions which negatively affect patient care and overburden facilities. Regional medical centers need to develop and implement emergency preparedness in accordance with the World Health Organization (WHO) standards and conduct regular live simulation exercises to test their readiness for health emergencies, extreme weather events, and disasters.[4] Gaps in legislative frameworks and fragmented public health systems are another challenge. Additionally, weak coordination among health institutions and inefficient referral systems hamper the goals of achieving integrated and cost-effective care to meet the goals of Healthy China 2030.

18. The proposed project introduces a transformational approach to address public health management gaps by strengthening public health institutional capacity in the People's Republic of China (PRC). While health system development has progressed following the rapid economic growth in the past decades, the PRC currently faces increasingly complex health challenges. These include an overreliance on hospital-centric curative care to the detriment of cost-effective preventive medicine, gaps in the quality and equitability of health care leading to overburdened

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1 State Council of the PRC. 2016. *Outline of the Plan for Healthy China 2030*. Beijing (in Chinese).
2 Health security is defined as the activities required, both proactive and reactive, to minimize the danger and impact of acute public health events that endanger people's health across geographical regions and international boundaries. World Health Organization (WHO). Health Security (accessed 25 April 2022).
3 Government of the PRC. 2021. *The Outline of the Fourteenth Five-Year Plan for National Economic and Social Development of the People's Republic of China and the Long-Range Objectives Through the Year 2035*. Beijing (in Chinese).
4 WHO. 2020. Rapid Hospital Readiness Checklist: Interim Guidance. Geneva.

urban hospitals, and a rapidly increasing elderly population requiring specialized services.5 The coronavirus disease (COVID-19) pandemic further highlights obstacles and development needs in the public health system led by the Government of the PRC. The project focuses on institutional strengthening of health security and the public health system in accordance with the PRC's aim to develop regional centers of public health excellence as demonstration models in economically underdeveloped areas in the proposed project sites. The loan will directly contribute to addressing the urgent financing needs of the PRC's public health system.

19. The project is aligned with the following impacts: (i) health and well-being of residents protected, promoted, and restored (footnote 1); (ii) capacity for early warning, risk reduction, and management of health security risks strengthened;[6] and (iii) prevention and control of major communicable diseases strengthened (footnotes 1 and 3). The project will have the following outcome: quality of public health services improved.

20. **Output 1: Public health institutional capacity and policies developed.** This output includes the following activities in the three project sites of GZAR, Guizhou Province, and Shaanxi Province:

(i) **Emergency preparedness and contingency planning.** The project will (a) establish international standard guidelines and standards for the advancement of disease control, infection prevention, laboratory biosecurity, risk communication, and community engagement; (b) conduct capacity building activities for multidisciplinary and coordinated responses for pandemics (footnote 5); and (c) conduct regular live outbreak simulation exercises to test readiness for health emergencies and disasters.

(ii) **Capacity building of public health workforce.** The project will conduct trainings for primary care and public health providers to increase their efficiency and delivery of high-quality services during public health emergencies and infectious disease outbreaks.

(iii) **Establishment of modern health management information systems.** The project will upgrade smart public health information systems to provide real-time disease surveillance with sex-disaggregated data by the participating hospitals to the government's system to facilitate, among others, the technical exchange of information with other health facilities for rapid response.

21. **Output 2: Effective public health ecosystem established.** This output includes the following activities to be carried out in the three participating hospitals in each project site:

(i) **Antimicrobial resistance surveillance system.** An antimicrobial resistance surveillance system will be established in each participating hospital to monitor the emergence of resistant strains of microorganisms to prevent infectious disease outbreaks.

(ii) **Laboratory support for the detection of emerging infectious diseases.** High-quality laboratories with effective biosecurity measures that produce test results in a timely manner will be established in the participating hospitals to ensure effective clinical management of infectious disease cases.

(iii) **Mental health and wellness programs.** To protect against the negative effects of public health hazards on mental health and well-being, particularly among the

[5] X. Li et al. 2020. Quality of Primary Health Care in China: Challenges and Recommendations. *The Lancet.* 395 (10239). pp. 1802–1812.

[6] Government of the PRC. 2016. *China's National Plan on Implementation of the 2030 Agenda for Sustainable Development*. Beijing.

elderly and those with long-term diseases such as heart disease and diabetes, preventive health programs promoting healthy lifestyles will be established in the project sites.

(iv) **Establishing and upgrading of hospital facilities.** One new health facility will be established in Guiyang, and existing facilities will upgraded in Fangchenggang and Yan'an project sites.[7] State-of-the-art medical equipment will be installed and support systems will be established, including women and child health facilities and accessibility facilities.

22. **Output 3: Training excellence and international cooperation capability enhanced.** This output includes:

(i) **Gender equality.** The project will establish health facilities with maternal and child health services to ensure the provision of a secure environment for women to have full access to essential and respectful health care even during health emergencies.

(ii) **Knowledge management.** The project will (a) establish cooperation platforms in the participating hospitals for documentation and sharing of best practices and lessons learned to improve evidence-based medical practice and gender-specific health issues (those that disproportionately or only affect women), (b) establish a regional public health training facility at each project site, (c) facilitate national and international partnerships with academic and specialized agencies to strengthen public health professional education and establish quality standards, and (d) support the PRC's knowledge cooperation with other DMCs, including neighboring countries.

23. The project is located in three cities: (i) Fangchenggang City, GZAR; (ii) Guiyang City, Guizhou Province; and (iii) Yan'an City, Shaanxi Province. One new health facility will be established in Guiyang, and existing facilities will be upgraded in Fangchenggang and Yan'an to support health security needs.

24. The project will be implemented from November 2022–December 2027. The executing agencies of the project will be (i) Fangchenggang Municipal People's Government, (ii) Guiyang Municipal People's Government, and (iii) Shaanxi Provincial Project Management Center. The project implementing agencies will be (i) Fangchenggang City Culture and Tourism Group Co. Ltd., (ii) Guiyang Municipal Sanitation and Health Bureau and Guiyang Transportation Investment Development Group Co., Ltd.; and (iii) Yan'an University Affiliated Hospital (Shaanxi Province).

B. Objective, Scope, and Methodology of the IEE

25. **Objectives and Scope**. This IEE report documents the environmental assessment of the physical infrastructure to be developed under the proposed project, and identifies the environmental risks and issues to be considered in the project planning and design stages. The IEE addresses, as far as required, the environmental, health and safety management requirements of the ADB's SPS 2009 as well as those of the country safeguard system of PRC.

26. The objectives of the IEE are to:

[7] Gross regional product per capita ranking of the three provinces in 2020 are Shaanxi (11), Guizhou (28), and GZAR (29). Government of the PRC, National Bureau of Statistics. 2021. China Statistical Yearbook 2021. Beijing (Table 3.9: Gross Regional Product, 2020).

(i) assess the existing environmental conditions in the project areas including the identification of environmentally sensitive areas;
(ii) provide guidance as to the assessment of suitability for construction locations;
(iii) review any legislative and approval requirements under which construction activities can occur; and
(iv) prepare an environmental management plan (EMP) incorporating mitigation and monitoring measures that will guide environmental management during project
(v) construction and operation.

27. The environmental studies have been confined to the subproject sites and its direct influence area. The IEE was based on proposed key construction activities. The corridor of impact is taken as a 50 m radius around the proposed facilities. However, the study area impact zone is considered up to 500 m radius to allow for coverage of indirect and induced impacts and a larger analysis of land use and other environmental features including the haulage of materials and equipment. Assessment is carried out on the environment elements of terrestrial and aquatic ecology, soil, water, air, noise, and socioeconomic aspects.

28. **Methodology**. The IEE has been conducted following the process established in the SPS 2009 and complies with the country safeguard system. The study was carried out based on reconnaissance survey to subproject sites, field visits, consultation with stakeholders, review of secondary data, identification of adverse impacts, and preparation of environmental management and monitoring plans. The stepwise activities carried out include:

(vi) review of legal requirements;
(vii) review of technical feasibility study reports;
(viii) reconnaissance survey for identification of key issues data requirement and preliminary consultations;
(ix) primary and secondary data collection;
(x) consultation with stakeholders; and
(xi) identification of impacts and mitigation measures.

C. Structure of the IEE

29. In compliance with ADB SPS 2009 requirements, this IEE consists of 10 structured sections: (i) Introduction; (ii) Policy, Legal and Administrative Framework; (iii) Description of the Project; (iv) Description of the Environment; (v) Anticipated Environmental Impacts and Mitigation Measures; (vi) Consultations, Participation, and Information Disclosure; (vii) Grievance Redress Mechanism; (viii) Environmental Management Plan; and (ix) Conclusion and Recommendations. The executive summary is provided in the beginning of the report.

II. POLICY, LEGAL, AND ADMINISTRTIVE FRAMEWORK AND STANDARDS

30. This section discusses the national and the local legal and institutional framework within which the environmental assessment is carried out. It also identifies project-relevant international environmental agreements to which the country is a signatory.

A. Policy Framework and Planning Context

31. The project will support the PRC in implementing its Healthy China 2030 to improve the quality and services of the health care system; and its Fourteenth Five-Year Plan, 2021−2025 by implementing health system strengthening. The project is aligned with the Asian Development Bank's (ADB) Strategy 2030, accelerating progress in gender equality, strengthening governance and institutional capacity, and fostering regional cooperation and integration; as well as the country partnership strategy for the PRC, 2021–2025 which aims at strengthening national and regional health security under strategic priority 3.9. It also supports the United Nations' Sustainable Development Goal on promoting healthy lives and well-being.

B. National Legislative Framework for Environment Impact Assessment

32. The PRC has a range of laws, regulations, technical guidelines, and standards that govern the way in which environmental protection and EIA for projects must be implemented, including for pollution prevention and control on air, noise, water, ecology and solid waste, and technical guidelines on assessing ambient air, noise, surface water, groundwater, and ecological impacts.

33. The engineering subprojects would involve construction and operation of one hospital in Yan'an city, one hospital in Guiyang city, and one health management center and one public health training center in Fangchenggang city. The PRC laws, regulations, technical guidelines, and standards relevant to these subprojects include the (i) environmental protection management and pollution control; (ii) safe management of hazardous chemicals and storage and disposal of hazardous waste; (iii) EIA and information disclosure for construction projects; (iv) energy conservation and green building design and assessment; (v) noise insulation and indoor environmental quality; and (vi) design codes for health care facilities.

34. The primary national laws and regulations that governed the domestic EIA of the proposed project are as follows:

Table II-1: Applicable Environmental Laws and Regulations of the People's Republic of China

No.	Title of the Law/Regulation	Year Issued
National		
1	Environmental Protection Law	2015
2	Law on Prevention and Control of Air Pollution	2018
3	Law on Prevention and Control of Water Pollution	2018
4	Law on Prevention and Control of Environmental Noise Pollution	2018
5	Law on Prevention and Control of Solid Waste Pollution	2016
6	Environmental Impact Assessment Law	2018
7	Water and Soil Conservation Law	2011
8	Cultural Relics Protection Law	2017
9	Regulations on Environmental Protection of Construction Projects	2008
10	Measures for the Administration of Medical Waste in Medical and Health Institutions	2017

No.	Title of the Law/Regulation	Year Issued
11	Directory of Classification Management of Environmental Impact Assessment of Construction Projects	2021
12	Guidance on Promoting Public Participation in Environmental Protection	2018
13	Measures for Public Participation in Environmental Impact Assessment	2014
14	Management Measures for the Operation of Environmental Complaint Hotline	2018
15	Hazardous Chemical Safe Management Ordinance	2011
16	National Hazardous Waste List	2016
Local		
17	Regulations of Shaanxi Province on Prevention and Control of Air Pollution	2014
18	Regulations of Shaanxi Province on The Prevention and Control of Environmental Pollution by Solid Waste	2016
19	Shaanxi Province dust pollution special rectification action plan	2017
20	Regulations of Guizhou Province on Ecological and Environmental Protection	2019
21	Ecological Function Regionalization of Guizhou Province	2005
22	Interim Management Measures on Ecological Red Line of Guizhou Province	2016
23	Water Function Zoning of Guizhou Province	2005
24	Regulations of Guizhou Province on the Prevention and Control of Air Pollution	2018
25	Regulations of Guizhou Province on the Prevention and Control of Water Pollution	2018
26	Regulations of Guizhou Province on the Prevention and Control of Environmental Noise Pollution	2018
27	Regulations of Guangxi Zhuang Autonomous Region on Environmental Protection	2016
28	Regulations of Guangxi Zhuang Autonomous Region on Soil Pollution Prevention and Control	2021
29	Regulations of Guangxi Zhuang Autonomous Region on Water Pollution Prevention and Control	2020
30	Regulations of Guangxi Zhuang Autonomous Region on the Prevention and Control of Air Pollution	2018

35. The implementation of environmental laws and regulations is supported by applicable management and technical guidelines (**Table II-2**). These include impact assessment guidelines on general EIA program and principles, atmospheric environment, noise, surface water, groundwater, soil erosion, and ecology and biodiversity.

Table II-2: Applicable Technical Guidelines for Environment

No.	Technical Guideline	Year/Code
1	Technical Guideline on EIA-Outline	HJ 2.1-2016
2	Technical Guideline on EIA Regarding Surface Water	HJ/T 2.3-2018
3	Technical Guideline on EIA Regarding Atmospheric Environment	HJ 2.2-2018
4	Technical Guideline on EIA Regarding Acoustic Environment	HJ 2.4-2009
5	Technical Guideline on EIA Regarding Ecological Environment	HJ 19-2011
6	Technical Guidelines on EIA Regarding Groundwater	HJ610-2016
7	Technical Specification on Water and Soil Conservation Plan	GB 50433-2008
8	Technical Guideline on Environmental Risk Assessment for Construction Project	HJ/T 169-2018
9	Technical Specification for Urban Dust Prevention	HJ/T 393-2007
10	Green Building Evaluation Standard	GB/T50378-2019
11	Design Code for Energy Efficiency of Public Buildings	GB 50189-2015
12	Standard for Water-Saving Design of Civil Buildings	GB50555-2010
13	Guideline on Jurisdictional Authorities for Approval of EIAs of Construction Project	2009

No.	Technical Guideline	Year/Code
14	Code for Design of Water Supply and Drainage in Buildings	GB50015-2010
15	Code for Sound Insulation Design of Civil Buildings	GB50118-2010
16	Technical Requirements for Medical Waste Transfer Vehicle (Trial) (GB19217-2003);	HJ421-2008
17	Technical Specifications for the Collection, Storage and Transportation of Hazardous Wastes	HJ2025-2012
18	Technical Specifications for Hospital Sewage Treatment Engineering	HJ2029-2013
19	Standard for Pollution Control of Hazardous Waste Storage	GB18579-2001
20	Water Pollutant Discharge Standards for Medical Institutions	GB18466-2005
21	Technical Specifications for Centralized Disposal of Medical Wastes (Trial)	2003
22	Standard for Special Packaging Bags, Containers and Warning Signs for Medical Waste	2003
23	Code for Barrier-Free Design	GB50763-2012
24	Code for Architectural Design of General Hospital	GB51039-2014
25	Green Hospital Building Evaluation Standard	GB/T51153-2015

EIA = environmental impact assessment

C. International Agreements

36. The PRC is signatory to major international agreements dealing with environment protection. Those relevant to the site selection, construction and operation of the engineering subprojects are as follows:

(i) Conservation on Biological Diversity, 29 December 1993, to develop national strategies for the conservation and sustainable use of biological diversity;
(ii) Kyoto Protocol to the United Nations Framework Convention on Climate Change, 23 February 2005—to further reduced greenhouse gas emissions by enhancing the national programs of developed countries aimed at this goal and by establishing percentage reduction targets for the developed countries;
(iii) United Nations Framework Convention on Climate Change, 21 March 1994, to achieve stabilization of greenhouse gas concentrations in the atmosphere at a low enough level to prevent dangerous anthropogenic interference with the climate system;
(iv) UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, 1985—this convention integrates the practice of heritage conservation in the PRC with that being done around the world;
(v) Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1992—the overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous waste; and
(vi) Convention on International Prior Informed Consent Procedure for Certain Trade Hazardous Chemicals and Pesticides in International Trade Rotterdam, 2004—the objective of this convention is to promote shared responsibility and cooperative efforts among parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use.

D. Applicable Asian Development Bank and the People's Republic of China Policies and Assessment Categories

37. The ADB SPS (2009) establishes an environmental review process to ensure that projects undertaken as part of programs funded through ADB loans are environmentally sound are designed to operate in line with applicable regulatory requirements and are not likely to cause significant environment, health, social, or safety hazards. Based on the SPS, the project is classified as category B and an IEE is required. The categorization of B is defined by the SPS as: "proposed project's potential environmental impacts are less adverse and fewer in number than those of category A projects; impacts are site-specific, few if any of them are irreversible, and impacts can be readily addressed through mitigation measures."

38. During the design, construction, and operation phases of a project, the SPS also requires the borrower to follow environmental standards consistent with good international industry practice as reflected in internationally recognized standards such as the WBG EHS Guidelines (footnote 6). The guidelines provide guidance and standards for ambient air quality, air emissions, wastewater, and other variables, and performance indicators and prevention approaches. When host country regulations differ from these levels and measures, the borrower is to achieve whichever is more stringent. If less stringent levels or measures are appropriate given specific project circumstances, the borrower is required to justify any proposed alternatives.

39. In accordance with the PRC Guideline on Environmental Impact Assessment Classification for Construction Projects (2021 amended), the environmental classification for health care facility is mainly determined by the scale. If the number of beds is greater than 500, then the health care facility is classified as environmental Category A. Therefore, the proposed health care facilities for Yan'an and Guiyang are classified as PRC Category A, requiring preparation of full environmental impact statement (EIS). The Fangchenggang subproject is PRC environmental Category B, requiring preparation of an environmental impact table (EIT).

E. Evaluation Standards for Proposed Subprojects

1. Ambient Environmental Quality Evaluation Standards

a. Ambient Air Quality Standard

40. The PRC ranks air quality into two classes according to its Ambient Air Quality Standard (GB 3095-2012). Class 1 standards apply to special areas such as nature reserves and environmentally sensitive areas, and Class 2 standards apply to all other areas, including urban and industrial areas. The PRC standards for Class 2 areas are applicable to the Project.

41. The World Bank Group adopted the World Health Organization (WHO) standards for its EHS standards for air quality.[8] The WHO Global Air Quality Guidelines offer global guidance on thresholds and limits for key air pollutants that pose health risks. In addition to guideline values, the WHO Global Air Quality Guidelines provide interim targets aimed at promoting a gradual shift from high to lower concentrations. Table II-3 compares the PRC's GB 3095-2012 Class II standards with the World Bank Group's EHS standards.

[8] World Health Organization. WHO global air quality guidelines (particulate matter, ozone, nitrogen dioxide, sulfur dioxide and carbon monoxide), 2021.

42. Class 2 standards of 24-hour SO_2 (0.15 mg/m^3) is higher than the upper limit of the World Bank Group's interim standards (0.125 mg/m^3); while 24-hour PM_{10} (0.15 mg/m^3) and $PM_{2.5}$ (0.075 mg/m^3), 1-year NO_2 (0.04 mg/m^3) and PM2.5 (0.035 mg/m^3) are the same as the upper limit of the WHO's upper limit of interim standard, respectively. Overall, the PRC standards show a high degree of equivalency to the WHO guidelines or interim target values and are adopted for use in the Project.

Table II-3: Comparison of the People's Republic of China's GB 3095-2012 and WHO/World Bank Group Environment, Health, and Safety Ambient Air Quality Standards

(μg/m^3)

No.	Item	Averaging Period	GB 3095-2012 Class 2	WHO's global air quality guidelines	
				Interim Targets	AQG
1	SO_2	1-year	0.06	n/a	n/a
		24-hour	0.15	0.05-0.125	0.04
		1-hour	0.50	n/a	n/a
2	PM_{10}	1-year	0.07	0.02-0.07	0.015
		24-hour	0.15	0.05-0.15	0.045
3	$PM_{2.5}$	1-year	0.035	0.01-0.035	0.005
		24-hour	0.075	0.025-0.075	0.015
		1-hour	n/a	n/a	n/a
4	NO_2	1-year	0.04	0.02-0.04	0.010
		24-hour	0.08	0.05-0.12	0.025
		1-hour	0.20	n/a	n/a
5	CO	24-hour	4.0	7.0	4.0
		1-hour	10.0	n/a	n/a
6	O_3	Daily maximum 8-hour average	0.16	0.12-0.16	0.10
		1-hour	0.20	n/a	n/a

AQG = air quality guideline; EHS = environment, health, and safety; n/a = not applicable, WBG = World Bank Group.

43. Class 2 standards of 24-hour SO_2 (0.15 mg/m^3) and $PM_{2.5}$ (0.15 mg/m^3) are higher than the upper limit of the WBG's interim standards (0.125 mg/m^3 and 0.075 mg/m^3 respectively); while 24-hour PM_{10} (0.15 mg/m^3) and 1-hour NO_2 (0.20 mg/m^3) are the same as the upper limit of the WBG's upper limit of interim standard and guideline standard, respectively. Overall, the PRC standards show a high degree of equivalency to the WHO guidelines or interim target values and are adopted for use in the project.

1. Surface Water

44. For water quality assessment, the determining standard is the PRC's Environmental Quality Standards for Surface Water (GB 3838-2002). It defines five water quality categories for different environmental functions. Category I is the best, suitable for head waters and National Nature Reserves. Category II is suitable for drinking water sources in Class I protection areas, habitats for rare aquatic organisms, breeding grounds for fish and crustaceans and feeding grounds for juvenile fish. Category III is suitable for drinking water sources in Class II protection areas, wintering grounds for fish and crustaceans, migration. There are no applicable WBG EHS guidelines for water quality in this context, and the PRC standard is adopted for use in this IEE report. Yanhe River is in the west side of Yan'an site. According to the Water Environment Function Zoning of Shaanxi Province (2004), Yanhe River is Category III water body.

Table II-4: Surface Water Ambient Quality Standard
(unit: mg/l, pH is dimensionless)

Parameter	GB 3838-2002				
	Category				
	I	II	III (Yanhe River)	IV	V
pH	6 ~ 9	6 ~ 9	6 ~ 9	6 ~ 9	6 ~ 9
Dissolved oxygen (DO) [mg/l]	90% saturation or ≥7.5	≥6	≥5	≥3	≥2
Permanganate index (I_{Mn}) [mg/l]	≤2	≤4	≤6	≤10	≤15
Chemical oxygen demand (COD) [mg/l]	≤15	≤15	≤20	≤30	≤40
5-day Biochemical oxygen demand (BOD_5) [mg/l]	≤3	≤3	≤4	≤6	≤10
Ammonia nitrogen (NH_3-N) [mg/l]	≤0.15	≤0.5	≤1.0	≤1.5	≤2.0
Total phosphorus (as P) [mg/l]	≤0.02	≤0.1	≤0.2	≤0.3	≤0.4
Lakes & reservoirs	≤0.01	≤0.025	≤0.05	≤0.1	≤0.2
Total nitrogen (lakes, reservoirs, as N) [mg/l]	≤0.2	≤0.5	≤1.0	≤1.5	≤2.0
Copper (Cu) [mg/l]	≤0.01	≤1.0	≤1.0	≤1.0	≤1.0
Zinc (Zn) [mg/l]	≤0.05	≤1.0	≤1.0	≤2.0	≤2.0
Fluoride (as F^-) [mg/l]	≤1.0	≤1.0	≤1.0	≤1.5	≤1.5
Selenium (Se) [mg/L]	≤0.01	≤0.01	≤0.01	≤0.02	≤0.02
Arsenic (As) [mg/l]	≤0.05	≤0.05	≤0.05	≤0.1	≤0.1
Mercury (Hg) [mg/l]	≤0.0005	≤0.0005	≤0.0001	≤0.001	≤0.001
Cadmium (Cd) [mg/l]	≤0.001	≤0.005	≤0.005	≤0.005	≤0.01
Chromium (Cr, hexavalent) [mg/l]	≤0.01	≤0.05	≤0.05	≤0.05	≤0.1
Lead (Pb) [mg/l]	≤0.01	≤0.01	≤0.05	≤0.05	≤0.1
Cyanide (CN) [mg/l]	0.005	≤0.05	≤0.2	≤0.2	≤0.2
Volatile phenol [mg/l]	≤0.002	≤0.002	≤0.005	≤0.01	≤0.1
Total petroleum hydrocarbon (TPH) [mg/l]	≤0.05	≤0.05	≤0.05	≤0.5	≤1.0
Anionic surfactant [mg/l]	≤0.2	≤0.2	≤0.2	≤0.3	≤0.3
Sulfide [mg/l]	≤0.05	≤0.1	≤0.2	≤0.5	≤1.0
Fecal coliform bacteria [number/l]	≤200	≤2000	≤10,000	≤20,000	≤40,000

COD_{Mn} = permanganate index; CODcr = chemical oxygen demand; BOD_5 = 5 days biochemical oxygen demand; NH_3-N= ammonia nitrogen; TP = Total Phosphorus; TN = Total Nitrogen.

a. Acoustic Environment

45. The Ambient Acoustic Environment Standard (GB 3096-2008) categorizes five functional areas based on their tolerance to noise pollution: from Class 0 to Class 4. Class 0 is for areas with convalescent facilities that are the least tolerant to noisy environments and therefore have the most stringent day and night time noise standards. Class 1 is for areas predominated by residential areas, hospitals and clinics, educational institutions, and research centers. Class 2 is

for areas with mixed residential and commercial functions. Class 3 is for areas with industrial production and storage and logistics functions. Class 4 is for regions adjacent to traffic noise sources such as major roads and highways and is subdivided into 4a and 4b with the former applicable to road and marine traffic noise and the latter applicable to rail noise. Standards for various functional area categories and are compared with the WBG EHS guidelines as listed in **Table II-5**. This shows that the WBG has lower noise limits for residential, commercial, and industrial mixed areas but higher noise limits for industrial areas and nighttime noise near trunk roads. **Table II-6** presents the applicable acoustic environmental standard of each engineering subproject.

Table II-5: Environmental Quality Standards for Noise
(Equivalent Sound Level: LAeq: dB)

Noise Functional Area Category	Applicable Area	GB 3096-2008		World Bank Group EHS[a]	
		Day	Night	Day	Night
0	Areas needing extreme quiet, such as convalescence areas	50	40	55	45
1	Area mainly for residence, cultural and educational institutions	55	45		
2	Residential, commercial, and industrial mixed area	60	50		
3	Industrial area	65	55	70	70
4a	Area on both sides of urban road traffic trunk line	70	55		

Note: Functional Area 4 is divided into 4a for trunk roads and 4b for railway lines.
[a] World Bank Group 2007, ibid.

Table II-6: Applicable Ambient Acoustic Environment Standard

Subproject and Plot Name	Functional Area Category	Limits dB(A)		Remarks
		Day	Night	
Yan'an	Class 2	55	45	WBG EHS standard is adopted
Guiyang	Class 4a	70	55	The areas within 35 m of the road
	Class 2	55	45	WBG EHS standard is adopted
Fangchenggang	Class 2	55	45	WBG EHS standard is adopted

2. Discharge Standard

a. Air Quality

46. Fugitive emission of particulate matter (such as dust from construction sites) is regulated under PRC 's Air Pollutant Integrated Emission Standard (GB 16297-1996), which sets 120 mg/m^3 as the maximum allowable emission concentration and ≤ 1.0 mg/m^3 as the concentration limit at the boundary of construction sites, with no specification on the particular matter 's particle diameter. There is no equivalent standard recommended in the WBG EHS guidelines, therefore the PRC standard is applied for the project.

47. Shaanxi Province has local standard for dust emission in construction site, the Boundary Dust Emission Limits for Construction Sites (DB61/1078-2017). The hourly average of total suspended particulate (TSP) shall not be greater than 0.8 mg/m^3 during earth excavation and foundation construction. The Boundary Dust Emission Limits for Construction Sites (DB61/1078-2017) is applicable for the Yan'an subproject as the local standards are more stringent than national standards.

48. The concentration of air pollutants around the sewage treatment stations in the hospitals shall comply with the Sewage Discharge Standard for Medical Institutions (GB18466-2005). The maximum allowable concentration standards for atmospheric pollutants around the sewage treatment station is given in **Table II-7**.

Table II-7: Atmospheric Pollutant Discharge Requirement for Wastewater Treatment Station of Medical Institutions

Pollutant	**Discharge to Water Body** (mg/l)
NH_3(mg/m^3)	1.0
H_2S(mg/m^3)	0.03
Odor (dimensionless)	10
Cl_2 (mg/m^3)	0.1
CH_4 (highest volume percentage %)	1

49. The PRC's Indoor Air Quality Standard (GB/T18883-2002) prescribes the concentration of 19 parameters for indoor air quality (**Table II-8**). These standards are applicable to the indoor environment inside the buildings, especially upon initial occupancy where indoor decoration and new furniture could emit various air pollutants such as formaldehyde, benzene, and volatile organic compounds. WBG EHS has no standard for indoor air quality but describes air pollutants such as VOC in the workplace.

Table II-8: Indoor Air Quality Standard (GB/T 18883-2002)

No.	Type	Parameter	Unit	Standard	Remark
1	Physical	Temperature	℃	22–28	Summer with air conditioning
				16–24	Winter with heating
2		Relative humidity	%	40–80	Summer with air conditioning
				30–60	Winter with heating
3		Air flow speed	m/s	0.3	N/A
				0.2	N/A
4		New wind volume	m^3/(h-person)	30	N/A
5	Chemical	Sulfur dioxide (SO_2)		0.50	Hourly average
6		(NO_2)	mg/m^3	0.24	Hourly average
7		Carbon monoxide (CO)	mg/m^3	10	Hourly average
8		Carbon dioxide (CO_2)	mg/m^3	0.10	Daily average
9		Ammonia (NH_3)	mg/m^3	0.20	Hourly average
10		Ozone (O_3)	mg/m^3	0.16	Hourly average
11		Formaldehyde (HCHO)	mg/m^3	0.10	Hourly average
12		Benzene (C_6H_6)	mg/m^3	0.11	Hourly average
13		Methylbenzene (C7H8)	mg/m^3	0.20	Hourly average
14		Dimthylbenzene(C_8H_{10}) (=xylol)	mg/m^3	0.20	Hourly average
15		Benzo[a]pyrene [B(a)P] ($C_{20}H_{12}$)	mg/m^3	1.0	Daily average

No.	Type	Parameter	Unit	Standard	Remark
16		Respirable suspended particulate (PM_{10})	mg/m^3	0.15	Daily average
17		Total volatile organic compound (TVOC)	mg/m^3	0.60	8-hour average
18	Biological	Total bacterial colony count	Cfu/m^3	2,500	N/A
19	Radioactive	Radon (^{222}Rn)	Bq/m^3	400	Annual average

b. Wastewater

50. Discharge of wastewater from construction sites is regulated under the PRC 's Integrated Wastewater Discharge Standard (GB 8978-1996). Class I standards apply to discharges into Category III water bodies under GB 3838-2002. Class II standards apply to discharges into Categories IV and V water bodies. Class III standards apply to discharges into municipal sewers going to municipal WWTPs with secondary treatment.

Table II-9: Integrated Wastewater Discharge

Parameter	Class I	Class II	Class III
	For discharge into Category III water body	For discharge into Category IV and V water bodies	For discharge into municipal sewer
pH	6–9	6–9	6–9
SS mg/L	70	150	400
BOD_5 mg/L	20	30	300
COD mg/L	100	150	500
TPH mg/L	5	10	20
Volatile phenol mg/L	0.5	0.5	2.0
NH_3-N mg/L	15	25	---
PO_4^{2-} (as P) mg/L	0.5	1.0	---
LAS (= anionic surfactant) mg/L	5.0	10	20

51. The medical wastewater from health care facility shall comply with the Water Pollutant Emission Standards for Medical Institutions (GB18466-2005). The domestic sewage of all project facilities shall satisfy with the Class B of Water Quality Standard for Wastewater Discharge into municipal sewers (CJ 343-2015). The EHS Guidelines for Health Care Facilities has effluent guidelines for direct discharge of treated effluents to surface waters but no pretreatment effluent standard.[9] The medical waste from the project facilities will be pre-treated on-site then discharge to the connected municipal WWTPs. The WWTPs are designed and operated as Class 1A of Urban Municipal Wastewater Plant Discharge Standard (GB18918-2002), which sets more stringent emission limits than EHS Guidelines so that the applicable discharge standard for the project facilities are CJ343-2015 (domestic wastewater) and GB18466-2005 (medical wastewater).

Table II-10: Water Pollutant Emission Standards for Medical Institutions

[9] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/policies-standards/ehs-guidelines#IndustryEHS

Pollutant	CJ343-2015 (for domestic sewage) (mg/l)	GB 18466-2005 (for medical wastewater) (mg/l)		EHS Guidelines	Class 1A of GB18918-2002
		To municipal sewage treatment network	Direct to the surface water		
pH	6-9	6-9	6-9	6-9	6-9
SS	400	60	20	50	10
BOD_5	350	100	20	50	10
CODcr	500	250	60	250	50
NH_3-N	45	N/A	15	N/A	5
Cadmium (Cd)	0.1	0.1	0.1	0.05	0.01
Chromium (Cr)	1.5	1.5	1.5	0.5	0.1
Lead (Pb)	1.0	1.0	1.0	0.1	0.1
Mercury (Hg)	0.02	0.05	0.05	0.01	0.001
Chlorine, total residual	N/A	N/A	0.5	0.2	
Oil and grease	100	20	5	10	1
Number of fecal coliforms (MPN/L)	500	5,000	500	4000	1000
Total residual chlorine	/	Contact time: greater than 1 hour; outlet of contact tank: 2-8 mg/L	Contact time: greater than 1 hour; outlet of contact tank: 3-10 mg/L	N/A	N/A

c. Noise

52. Construction noise will be assessed against the standards in Emission Standards of Ambient Noise for Boundary of Site Noise (GB 12523-2011), which are set out in Error! Reference source not found. **II-11**. Table II-11 also presents the noise limits at workplace recommended by WBG EHS Guidelines: Occupational Health and Safety Standard that applies to the project. The functional area category of the project area for ambient acoustic environment is given in **Table II-6**. The noise emission limits during operation are determined by the functional area category of the site and Emission Standard for Industrial Enterprises Noise at Boundary (GB 12348-2008).

Table II-11: Site Noise Limits

(L_{Aeq} [dB (A)])

Period	Major Noise Source	Functional Area Category	Noise Limit (at site boundary)		WBG EHS Guidelines (at workplace)
			Day	Night	
Construction	Bulldozer, excavators and loader; pile driving machines; concrete mixer, vibrator and electric saw; hoist and lifter.	/	70	55	Occupational health and safety: 85 (equivalent level; L_{Aeq}: 8h)/110 (maximum L_{Amax})
Operation	Pumps, fans	0	50	40	
		1	55	45	
		2	60	50	
		3	65	55	
		4	70	55	

d. Vibration

53. Vibration could be described in terms of acceleration, velocity, or displacement. International Guidelines and Standards present criteria for vibration related building damage in the form of threshold levels of vibration (peak particle velocity - ppv), as either a value or range of values. Internationally, there are various criteria to evaluate vibration, such as Evaluation of Human Exposure to Whole-Body Vibration-Part 2: Continuous and Shock-Induced Vibrations in Buildings (1-80 HZ) (International Organization for Standardization (ISO) 2631-2:2003); DIN-4150-2 Vibration in Buildings-Part 2: Effects on Persons in Buildings (German) etc. The PRC Standard for Urban Area Environmental Vibration (GB 10070-88) uses vertical Z-axis direction vibration level in decibel for evaluation. As the measurement methods are different, there is no comparable international standard. The PRC standard is adopted for the project. However, international guidelines and standards particularly Caltrans and DIN 4,159 (i.e., ppv 3 mm/s) will be referred for building damage assessment. Construction activities are likely to cause vibration impact, and should comply with the Standard for Urban Area Environmental Vibration (GB 10070-88). The details are shown in **Table II-12**. The project works are located on villages and communities, where standard 2 applies (daytime 70 VdB, nighttime 67 VdB).

Table II-12: Vibration Standard Value for Various Urban Areas (Vertical Z-axis direction) (V dB) [a]

Scope of applicable area	Day	Night
Special residential area	65	65
Residential, cultural and educational area	70	67
Mixed area and commercial center	75	72
Industrial centralized area	75	72
Both sides of traffic trunk line	75	72
Both sides of railway main line	80	80

[a] Decibel notation acts to compress the range of numbers required to describe vibration. Vibration velocity level in decibels is defined as $L_v=20*lg(V/V_{ref})$, where "L_v" is the velocity level in decibels, "V" is the rms velocity amplitude, and "V_{ref}" is the reference velocity amplitude referenced to $1*10^{-6}$ m/s^2. Although not a universally accepted notation, the abbreviation "VdB" is used in this IEE for vibration decibels to avoid the potential for confusion with sound decibels.

e. Solid Waste

54. The medical waste and sludge from medical wastewater treatment station are identified as hazardous wastes. The packing, storage, and transportation of hazardous waste is subject to the requirements of Hazardous Waste Storage Pollution Control Standard (GB 18597-2001), Technical Specification on Hazardous Waste Collection and Transportation (HJ 2025-2012) and WBG EHS Guidelines for Health Care Facilities. The Safe Management of Wastes from Health Care Activities: A Summary by WHO,[10] also highlights the key aspects of safe health care waste management to guide facility managers and practitioners. The sludge from medical wastewater treatment station shall comply with the Table 4 of Water Pollutant Discharge Standard for Medical Institutions (GB 18466-2005) as shown in table below.

Table II-13: Standards for Sludge Control in Medical Institutions

Fecal coliforms Number (MPN/g)	**Enteropathogenic Bacteria**	**Enteroviruses**	**Mycobacterium Tuberculosis**	**Ascaris eggs mortality** (%)
Less than 100	--	--	--	95

[10] WHO, 2017. *Safe Management of Wastes from Health Care Activities: A Summary*. Geneva. https://www.who.int/water_sanitation_health/publications/safe-management-of-waste-summary/en/,

III. DESCRIPTION OF THE PROJECT

A. General

55. The proposed project comprises three subprojects involving the construction and operation of physical infrastructure facilities such as buildings, training centers and installation of associated facilities and equipment. This IEE and attached EMP therefore focuses on assessing and mitigating potential environmental impacts during construction and operation of these facilities. Table III-1 shows the domestic environmental assessment reporting requirements and approval status for these subprojects. The EIA and environmental impact tables (EIT) have been prepared for these subprojects to meet domestic requirements. The approval authorities for these EIAs are the respective city or county EEBs. This IEE is prepared based on information provided in domestic EIAs and EIT, feasibility study reports (FSRs) for these subprojects, as well as site reconnaissance by the TA consultants.

Table III-1: Domestic Environmental Assessment Reporting for Project Subprojects

No.	Subproject Name	Report Type	Compilation Situation		Approval Status
			Implementing Agency	Domestic EIA Preparation Time	
1	Fangchenggang International (ASEAN) Traditional Medicine Cooperation Center	EIT	Fangchenggang City Culture and Tourism Group Co, Ltd.	April 2022	To be approved by Fangchenggang EEB prior to commencement of construction
2	Guiyang Traditional Chinese Medicine (TCM) Hospital	EIA	Guiyang Municipal Sanitation and Health Bureau	April 2022	To be approved by Guiyang EEB prior to commencement of construction
3	Yan'an Women and Children's Branch of the Affiliated Hospital of Yan'an University	EIA	Yan'an University Affiliated Hospital (Shaanxi Province)	March 2022	To be approved by Yan'an EEB prior to commencement of construction

EEB=ecology and environment bureau

B. Nature, Size, and Location of the Project Facilities

56. Under the infrastructure component the proposed project will support construction of physical infrastructure facilities such as hospital buildings and training centers, procurement and installation of equipment and other auxiliary facilities.

57. In Fangchenggang the project will construct a Traditional Chinese Medicine Health Management Center (Occupational Disease Prevention Center), ASEAN public health training base, purchase and installing the medical equipment. The project facilities will occupy a land area of 11,452.68 m^2.

58. In Guiyang the project will construct a hospital of traditional Chinese medicine with a total capacity of 800 beds (first phase of 500 beds and second phase 300 beds), medical technology, health center and other medical facilities, and training rooms. The project facilities will occupy a land area of 136,026 m^2.

59. In Yan'an the project will construct a women and children's branch hospital, purchase and installing the medical equipment, development of a regional information platform to improve health care capacity. The project facilities will occupy an area of 32,138.15 m^2 (48.21 mu) of state-owned land, with a total construction area of 110,752.36 m^2, including 86,442.35 m^2 above ground and 24,310.01 m^2 underground.

60. These project facilities are located in Yan'an city of Shaanxi Province; Guiyang city of Guizhou Province; and Fangchenggang city is Guangxi Zhuang Autonomous Region of PRC. The site location of each project is indicated in **Figure III-1**.

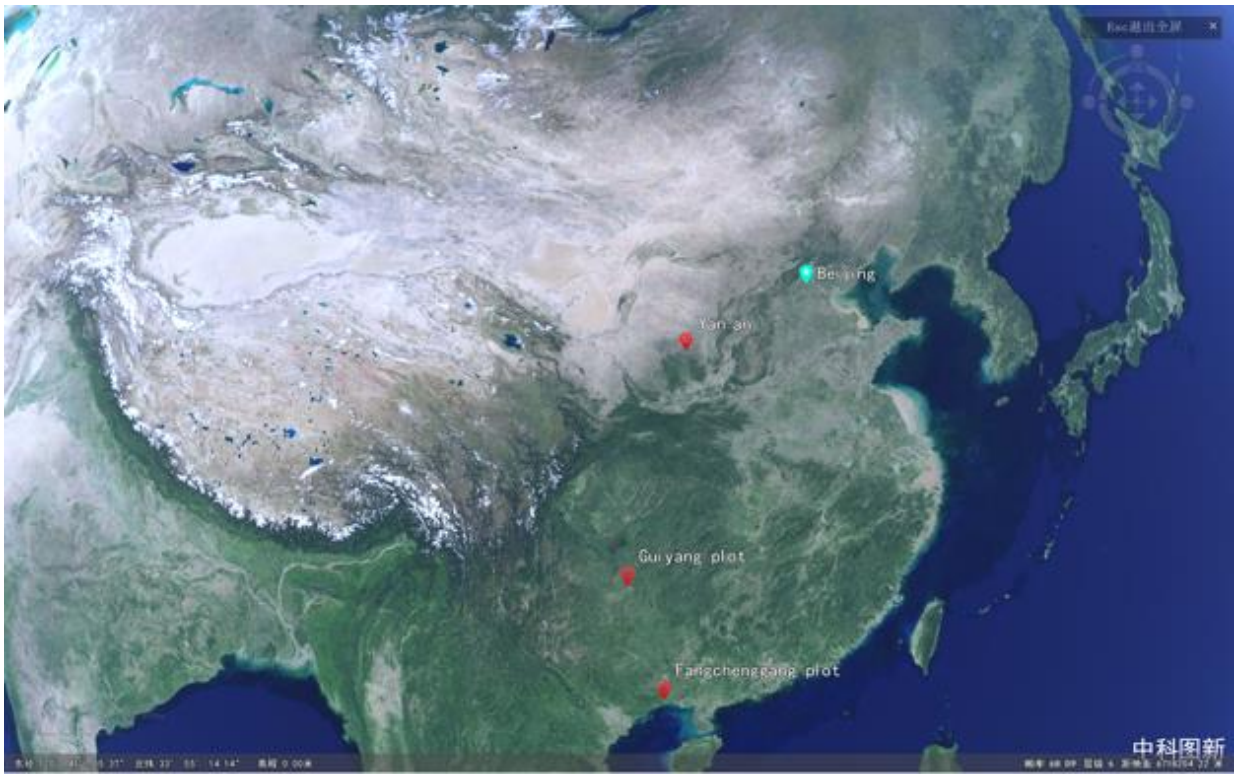


Figure III-1: Location of Project Facilities

C. Overview of Infrastructure Development by Subproject

61. This section details the overview and physical construction work of each subproject.

1. Subproject 1: Guiyang

62. **Overview and Location**. The proposed site is located in Guanshanhu District, Guiyang City, at the intersection of Jinhu Road and Wenzhi Road. The roads around the project are already

constructed, with municipal roads Jinhu Road, Jinhu Road, and the current county road Erzhu Road. The site plot is about 561 meters long in the south direction and 332 meters long in the west direction, where the west side of the site is the under construction. Jinhu Road is 64 meters wide, which is an urban expressway, and the north side of the site is the Wenzhi Road (40 meters wide) urban expressway. The site is divided into two blocks, separated by the road in the middle, the west side of the site along the street is about 230 m long and 250 m wide, the east side of the site is more irregular, along the street is about 220 m long and 130m wide. The plot will be connected to the existing public utilities through the pipes installed along the Jinhu road.

Figure III-2: Location map of Guiyang subproject site

63. **Physical Infrastructure**. The project site area is about 136,026.07 square meters, and the base is divided into two parcels, east and west, separated by city roads. The total construction area to be built is 137,320 square meters. The first phase has a construction area of 107,670 square meters, including 74,470 square meters of above ground construction area and 33,200 square meters of underground construction area.

Figure III-3: Layout of Guiyang subproject

64. The west parcel is a comprehensive medical building. The project will build an efficient, humanistic, and sustainable medical complex.

65. The comprehensive medical building contains three major functional areas: outpatient building, medical technology building and inpatient building, each functional area is arranged in an orderly manner from north to south, and the three functional areas are enclosed to create a semi-open, landscaped courtyard space. The outpatient building is divided into outpatient and emergency units along Wenzhi Road, and is connected from the outpatient hall to each clinic through the central medical street, with clear channels and clear priorities among the departments. The inpatient building is located at the southernmost side, which gets the best ventilation, light and landscape conditions. 500 beds can be realized in the first phase, and 300 beds can be added in the second phase. The existing functions are laid out in an efficient and centralized manner, and the land adjacent to the hill at the west end is reserved for the long-term, with a flexible design.

66. The east parcel is an administrative research area and the project will build a smart, ecological and resilient medical incubator.

67. All functions of the administrative and research area are integrated into the high-rise tower, and the four major functions of office, accommodation, training, and conference are arranged vertically from top to bottom. The entrance lobby is set up on the north side of the first floor of the high-rise, and the building facade is set up with staggered terraces and roof greening to fully create public activity space. On the east side of the intersection, a narrow triangular plot is used as a transition space for the urban interface, creating an open corner garden.

68. The podium runs through the east and west, integrating the two plots, and the main entrances of both plots are located on the north side of the street, so that the image of the two plots can be effectively related and not interfere with each other.

Table III-2: Main technical and economic indicators

Phase I technical and economic indicators (500-bed inpatient + 800-bed standard outpatient medical technology and other supporting functions)			
Indicators		Quantity	Unit
Total land area		136,026.07	Square meters
Planned net land area		107,218.93	Square meters
Total floor area		107,670	Square meters
Among them	Floor space on the ground	74,470	Square meters
	Ground floor area	33,200	Square meters
GFA		77,470	Square meters
Number of Beds		500	Bed
Volume ratio		0.72	/
Building density		20%	/
Green space ratio		35%	/
Building height		45	meters
Motor vehicle parking spaces		745	individual

2. Subproject 2: Fangchenggang

69. **Overview and Location**. Fangchenggang Cultural Tourism Group Co. Ltd. plans to build the Fangchenggang Traditional Chinese Medicine Hospital relocation project on the southwest side of the intersection of Xiwan Huanhai Avenue and Lizitan Highway in Fangchenggang City, which is to be constructed in three phases. The west side of Xiwan Huanhai avenue is tidal flat. The project plot is about 1 km to the Fangchenggang Bay. The first phase is mainly to build an outpatient and emergency comprehensive building, an inpatient comprehensive building, a traditional Chinese medicine infectious disease building, a fever clinic, as well as supporting facilities such as a sewage treatment station and solid waste collection station. The second phase mainly builds the Fangchenggang Medical Rehabilitation and Elderly Care Center. The third phase mainly builds a Chinese medicine health management center (occupational disease prevention and control center) and an ASEAN public health talent training base. This project will finance the phase three, which include Traditional Chinese Medicine Health Management Center (Occupational Disease Prevention Center), equipment procurement for Fangchenggang International (ASEAN) Traditional Medicine Cooperation Center, ASEAN Public Health Training Base, and ASEAN Public Health Institution Capacity Building. The plot will be connected to the existing public utilities installed along the Xiwan Huanhai Avenue.

70. **Physical Infrastructure**. The physical infrastructure to be developed as part of each facility is describe as below.

71. **Traditional Chinese Medicine Health Management Center (Occupational Disease Prevention and Control Center)**: The total floor area is 17,417.68 m^2, including 14,359.58 m^2 above ground floor area and 3,058.1 m^2 underground construction area, including physical examination department, occupational disease prevention research center, health consultation and guidance, etc., supporting 100 medical examination beds. The ground is 5 floors, the height

of the first floor is 5.1 m, the height of the second to fifth floors is 4.5 m, and the basement is 1 floor, the height of the floor is 5.4 m.

- -1F: Parking garage and equipment room.
- 1F: Inquiry, pediatric physical examination, adult physical examination.
- 2F: Health status assessment, consultation room, occupational disease examination room.
- 3F: Special examination room.
- 4F: testing and experiment.
- 5F: Mainly used for TCM health intervention, including TCM treatment rooms such as acupuncture, massage and cupping therapy, meeting rooms, toilets, doctors' offices, VIP experience rooms (20 beds) and roof garden.

72. **ASEAN Public Health Training Base**: It is located in the northwest corner of the plot and uses about 14,172.19 m^2 of land in the plot, including new training building, student dormitory, library, etc., with a total floor area of 49,977.21m^2, of which the above ground floor is 39,733.12 m^2, and the underground floor is 10,244.09m^2. It is a 2-story podium, and the above 3 floors are divided into two blocks, A and B; Block A is a 16-story complex building, Block B is an 8-story expert building; a total of 16 floors, of which the height of the first floor is 4.5m, the height of the second floor is 4.2m, and the height of the 3rd to 16th floors is 3.6 m.

- Basement: equipment room and parking space.
- 1F: Lecture hall, dining hall, kitchen, library and conference room for 1000 people.
- 2F: Dining room, kitchen, gym.
- 3F: Training room, OSCE test station, single dormitory.
- 4F: TCM training room and single dormitory.
- 5F: Multimedia classrooms, classrooms, single dormitories.
- 6F: Laboratory training room, single dormitory.
- 7F: Single room, four room.
- 8F: Suite, four-person dormitory.
- 9F-16F: Dormitory.

1=TCM health management center

2= Public Health Training Base

Figure III-4: Layout of the Fangchenggang subproject

3. Subproject 3: Yan'an-Yan'an Women and Children's Branch of the Affiliated Hospital of Yan'an University

73. **Location:** Yangjiawan Road, Baota District, Yan'an City, on the northwest side of the south plot of the Zuiyuan Campus of Yan'an University, bordering Transit Road to the north, Planning Road to the west and Yan'an University Road to the south, covering an area of approximately 48.2mu. The women and Children's Branch of the Affiliated Hospital of Yan'an University is proposed to be built on the north-western side of the south plot of the Cuiyuan campus of Yan'an University, bordered by the Transit Road to the north, the planned road to the west and the Yanda road to the south. The plot will be connected to the existing public utilities installed along the Yan'an University Road in the south.

74. **Physical Infrastructure**. The total construction area is 110,752 m^2, of which: the above ground construction area is 86,442 m^2, and the underground construction area is 24,310 m^2; the main construction content includes a 10-story outpatient complex building and a 9-story

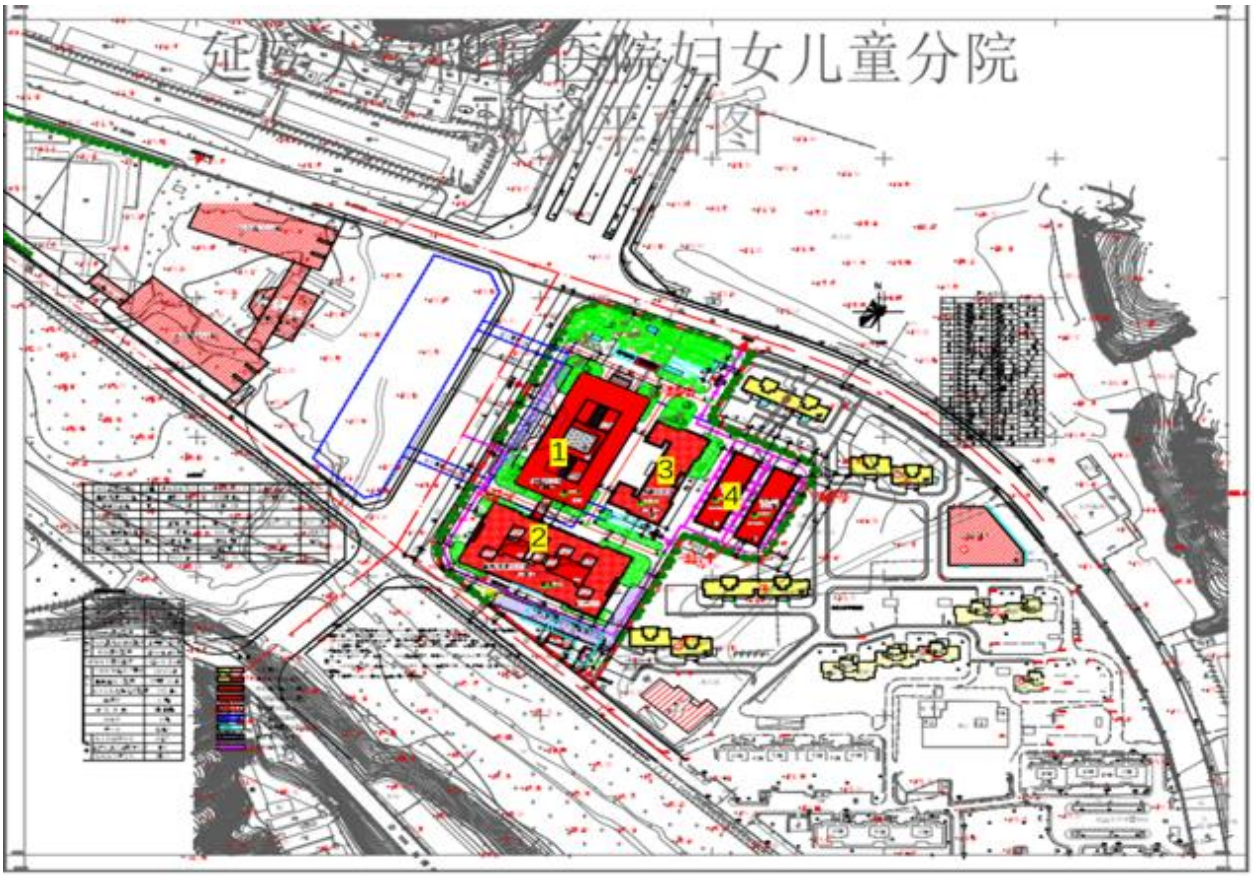
rehabilitation and health care complex building (formerly the experimental complex building of Yan'an University Cuiyuan Campus), a 6-story complex building (the former professional teaching building of Yan'an University Cuiyuan Campus) and other supporting facilities. A total of 500 beds are set up, and it is expected to receive 1,500 outpatient clinics per day.

75. The outpatient complex has 10 floors above ground and two floors underground, with a construction area of 58,927 m^2, an above ground construction area of 38,556 m^2, and an underground construction area of 20,371 m^2. Among them, emergency and first-aid are arranged on the north side of the first floor. The first to fourth floors are mainly for outpatient, the fifth floor is the delivery center and PICU (Children's Intensive Care Unit), the sixth floor is NICU (Newborn Children's Intensive Care Unit). In the neonatology and pediatric wards, the seventh to eighth floors are the obstetrics ward, the ninth floor is the gynecology ward and the multi-functional lecture hall, and the tenth floor is the maxillofacial surgery, static distribution center and reserved area. The rehabilitation health complex building, and the outpatient complex building are connected by corridors on the second to fourth floors.

76. The complex for rehabilitation and health care has nine floors above ground and one floor underground. The total construction area is 39,272 m^2, the aboveground construction area is 35,506 m^2, and the underground construction area is 3,766m^2. It mainly sets up functions such as fever clinic, physical examination center, child health care center, dental hospital, pediatric inpatient department, comprehensive internal medicine inpatient department, pregnancy and child health care center, rehabilitation center, maternity health care center, and reproductive medicine center.

77. The comprehensive building has six floors above ground and a total construction area of 10381m^2, which is mainly for catering business, living, administrative office and shift dormitory, and no medical function.

78. The frame structure of the rehabilitation and health complex building (the original experimental complex building) and the complex building (the original professional teaching building) has been completed, and only the internal functional structure and decorations are needed.



1= outpatient complex building; 2= complex building for rehabilitation and health care; 3= comprehensive building; 4=parking lot.

Figure III-5: Layout of Yan'an subproject

79. The hospital will have 42 departments, including women and children's treatment, genetic testing, assisted reproduction, medical personnel training, health management, and high-end rehabilitation medical treatment, and is committed to building a high-end, modern international hospital with a focus on women and children's medicine and the support of comprehensive clinical disciplines. The hospital is dedicated to building a modern, high-end international hospital for women and children.

D. Climate Change Adaptation Considerations

80. The climate risk and vulnerabilities of three subprojects have been analyzed. According to the climate risk and vulnerability assessment report the annual mean temperature in the project areas is likely to increase between 0.9°C to 1.1°C by 2040, 1.5°C to 2.4°C by 2060, 1.6°C to 5.3 °C by 2,100 under four shared socio-economic pathways (SSPs) (SSP1-2.6, SSP2-4.5, SSP3-7.0 and SSP5-8.5) comparing with 1995-2014. Higher temperatures will increase the burden of vector-borne, food-borne and water-related infectious diseases. The climate change adaptation cost is about 4 million USD to detection capacity of infectious diseases and improve the energy-efficient of the health care facilities. The climate change mitigation cost is 1.80 million USD for the incremental cost of green buildings (Facnghenggang and Guiyang to satisfy two stars rating, Yan'an to satisfy one star rating). The total greenhouse gas emission is 13,627 tCO_2e/year.

E. Analysis of Alternatives

81. An alternative analysis was conducted to justify the project based on a with and without-projectll alternative analysis. Since the subprojects will be constructed within the existing premises or close to existing hospitals no alternative sites were considered. Also, as the existing waste treatment and medical waste treatment and disposal facilities are available therefore option of constructing new treatment facilities is not considered.

82. The “no-project” alternative is not an option as the patients’ and health workers’ safety is currently compromised by lack of adequate health care facilities in project area. The no-project option would impede further social and economic development of the citizens of three project provinces. The “with-project” alternative will improve patients’ and health workers’ safety in hospitals in three project cities.

F. Associated and Existing Facilities

83. Based on SPS (2009) definition of associated facilities, the project does not have facilities that are not funded by the project but (i) whose viability and existence depend exclusively on the project, and (ii) whose goods and services are essential for successful operation of the project. The project facilities will be connected or covered by the existing public utilities which are identified as existing facilities.

84. Due diligence of project existing facilities have been carried out to assess risks and to verity availability and reliability of these facilities as elaborated below. The project will not cause population increase in the project area so will not bring new load to the existing municipal wastewater and municipal solid waste treatment system. The due diligence confirmed that the existing facilities identified are established and operated in accordance with the PRC regulations and laws.

1. Fangchenggang Subproject

85. In Fangchenggang, the medical wastewater and medical waste from the health management center of Fangchenggang subproject will use the wastewater treatment station and hazardous waste storage room of Fangchenggang traditional Chinese medicine hospital. Therefore, Fangchenggang traditional Chinese medicine hospital is an associated facility of the Fangchenggan subproject. The environmental impact assessment and design of Fangchenggang traditional Chinese medicine hospital are under preparation. The construction of Fangchenggang traditional Chinese medicine hospital is expected to start in 2023, with a construction period of 30 months. The total capacity of the wastewater treatment station is 1000 m^3/d, including the 34.07 m^3/d from the health management center of the project. The area of the hazardous waste storage room is 48 m^2, including the storage of 6.97 kg/d hazardous waste from the health management center.

86. After pretreatment on-site, the medical wastewater will be discharged into the municipal sewage network then to the Xiwan wastewater treatment plant (WWTP), which is under construction and is expected to be operating in 2023. The capacity of Xiwan WWTP is 5,000 m^3/d, which is adequate to receive the wastewater from the project.

87. The medical waste will be disinfected in the Fangchenggang Medical Waste Treatment Center,[11] then sent to Fangchenggang Waste to Energy Incineration Plant. The Fangchenggang Medical Waste Treatment Center has a capacity of 3 t/d currently and is under expansion. The EIA of the expansion work was approved by Fangchenggang EEB in 2021. The total capacity is expected to be 8t/d in 2023 after expansion. The total hazardous of Fangchenggang subproject is about 2 t/a, which is 0.07% of the total capacity.

88. The municipal waste from the Fangchenggang subproject and the disinfected medical waste will be disposed at the Fangchenggang Waste to Energy Incineration Plant. The incineration plant has a capacity of 500 t/d and currently is under expansion. The EIA for the expansion work was approved by Fangchenggang EEB in 2020. The emission standard is Pollution Control Standard for Municipal Solid Waste Incineration (GB18485-2014). By 2023, the total capacity of the incineration plant will reach 1000 t/d. The solid waste generated by the subproject (2.87 t/d) only accounts for 0.028% of the total capacity. The incineration plant has a landfill of 150,000 cubic meters capacity to dispose the fly ash that designed for a 25 years operation.

Figure III-6: Fangchenggang waste to energy incineration plant

2. Guiyang subproject

89. The sewage from Guiyang subproject will be discharged into Guiyang Jinbai WWTP, which was built in 2017. Guizhou Guiyang Jinbai Sewage Treatment Plant adopts advanced sewage treatment process to improve A^2/O, with a sewage treatment scale of 15,000 m^3/d and a long-term treatment scale of 30,000 m^3/d. The EIA for the Guiyang Jinbai was approved by Guiyang EEB in 2014. The effluent was upgraded to Class 1A in 2021.

90. The medical waste will be sent to the Guiyang Medical Waste Treatment Center (certificate no.: GYWF52010001), operated by Guiyang Urban Environment Investment CO. LTD. The current capacity is 50 t/d and will be expanded to 90 t/d in 2023. The EIA for the expansion was

[11] http://sthjj.fcgs.gov.cn/tzgg/202203/t20220315_245917.html certificate list of hazardous waste disposal.

approved by Guiyang EEB in 2021. The medical waste treatment center uses an incineration process. The fly ash is disposed at the landfill site within the treatment center. The hazardous waste amount of Guiyang subproject is about 1.01 t/d, which only accounts for 1% of the total capacity.

Figure III-7: Guiyang medical waste disposal center

91. The existing facilities identified for the Guiyang subproject are connected to Guiyang EEB's online supervision platform. The review of the operation data disclosed on the Guiyang EEB's website confirm their establishment and operation complied with PRC's environmental regulations and emission standards.

3. Yan'an Subproject

92. The medical waste will be handled by Yan'an Shengyuan Medical Waste Disposal Company (certificate no.: HW6106020005), which has a capacity of 12 t/d. After crushing and disinfection under high temperature, the medical waste will be sent to Yan'an sanitary landfill site. The Yan'an sanitary landfill site has a capacity of 4.97 million cubic meters, which will also receive the municipal solid waste from project activities. The Yan'an subproject will generate about 0.71t/d hazardous waste, which accounts for 5.9% of the total capacity.

Figure III-8: Yan'an Shengyuan Medical Waste Disposal Center

Figure III-9: Yan'an Sanitary Landfill Site

93. The Yan'an WWTP will receive and treat the wastewater from the Yan'an subproject. It has a capacity of 70,000 m^3/d. The wastewater is treated to Class 1A of Urban sewage treatment plant pollutant discharge standard.

94. The existing facilities identified for the Yan'an subproject are connected to Yan'an EEB's online supervision platform. The review of the operation data disclosed on the Yan'an EEB's website confirm their establishment and operation complied with PRC's environmental regulations and emission standards.

G. Cost and Implementation Schedule

95. The overall project is estimated to cost $652.05 million. The government has requested a loan equivalent to $300 million from ADB's ordinary capital resources to help finance the project and remaining amount will be funded by government as counterpart funding. The project will be implemented from September 2022 to December 2027. The construction of each facility will last from 36 to 72 months in total. The overall EMP will be adjusted at the time of loan effectiveness, then be reviewed, and updated on an annual basis during the project implementation period. The proposed overall project implementation plan is set out in Table III-3 below.

Table III-3: Overall Project Implementation Plan

Activities		Year 1 2022				Year 2 2023				Year 3 2024				Year 4 2025				Year 5 2026				Year 6 2027			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
A. Design and Monitoring Framework																									
Output 1: Public health institutional capacity and policies developed																									
1.1	Draft guidelines and standards for disease control and prevention, including infection prevention and control for health facilities and laboratory biosecurity.																								
1.2	Provide technical advice and recommendations for the preparation of related policies and operational plans to strengthen health security.																								
1.3	Formulate gender-responsive hospital emergency preparedness plans formulated																								
1.4	Conduct workshop and simulation exercises with different sectors for coordinated response for pandemics.																								
1.5	Consult with academics, specialized agencies, and other development partners on research partnership and plan for the conduct of scientific research on priority public health issues.																								
1.6	Establish multisector collaboration mechanism.																								
1.7	Conduct research and finalize arrangements for publication.																								
1.8	Consult with the private sector on potential partnerships and follow through with agreements.																								
Output 2: Effective public health ecosystem established																									
2.1	Prepare and finalize detailed engineering design and site preparation for the construction of public health facilities.																								
2.2	Develop bidding documents, conduct tenders, and award contracts.																								
2.3	Bid for construction works and procurement of public health equipment and other medical supplies.																								
2.4	Deliver and install medical equipment and other medical supplies to public health facilities.																								
2.5	Upgrade hospital laboratory facility and equipment																								
2.6	Finalize operation and maintenance arrangements and turnover of rehabilitated public health facilities.																								
2.7	Develop gender policy to include employment targets for women and clinical protocols review for gender equity.																								

Activities		Year 1 2022				Year 2 2023				Year 3 2024				Year 4 2025				Year 5 2026				Year 6 2027			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
2.8	Pilot innovative technology for emergency response in project provinces.																								
2.9	Develop modernized guidelines for the operation of public health facilities.																								
Output 3: Training excellence and international cooperation capability enhanced																									
3.1	Consult with academics, specialized agencies, and other development partners on the development of sustainable capacity building training for multisector (e.g., One Health) staff.																								
3.2	Finalize training arrangements and conduct training including at subnational level.																								
3.3	Complete scientific research projects on public health.																								
3.4	Establish regional platform for knowledge sharing.																								
3.5	Implement health talks with for the general public aimed at promoting healthy lifestyles and preventing disease.																								
3.6	Conduct annual consultations with consumer and women's groups.																								
B. Management Activities																									
1.	Establish project management units and project implementation units in project areas.																								
2.	Establish monitoring and evaluation system with the executing and implementing agencies to enable assessment of capacity for management of public health emergencies.																								
3.	Establish coordination arrangement with the executing and implementing agencies, including regular consultations to prevent implementation delays of any activity.																								
4.	Implement the EMP, resettlement plan, EMDP, GAP, and participation plan, and monitor their implementation.																								
5.	Periodically review financial and procurement management and promptly address any issue to avoid delays in the procurement of goods and services, and disbursements.																								
6.	Monitor project implementation, including data collection from project partners and stakeholders to substantiate project progress reporting.																								
7.	Submit quarterly progress reports and annual reports from 2022 to 2027.																								

Activities		Year 1 2022				Year 2 2023				Year 3 2024				Year 4 2025				Year 5 2026				Year 6 2027			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
8.	Submit semiannual monitoring and evaluation reports on the EMP, resettlement plan, EMDP, and GAP implementation to ADB, covering Q2 2022–Q2 2028																								

DMF = design and monitoring framework, Q = quarter
Source: ADB

IV. DESCRIPTION OF THE ENVIRONMENT

96. This chapter emphasizes on the description of physical, biological, and socioeconomic conditions of three project regions namely Fangchenggang in Guangxi Zhuang Autonomous Region, Guiyang in the central part of Guizhou Province, and Yan'an city in the southern half of northern Shaanxi Province. Specific focus given on the environment conditions at the three project sites where project facilities will be constructed. The description is presented subproject wise.

A. Fangchenggang

1. Physical Setting

97. **Location.** Fangchenggang city is located in the south of Guangxi Zhuang Autonomous Region and the southwest end of PRC's mainland coastline, between north latitude 20°36'~22°22' and east longitude 107°28'~108°36'.

98. **Topography and landform**. There are no active fractures passing through the project construction site and its vicinity, and there are no adverse geological effects such as landslides and cave-ins, and the site stability is good. According to Appendix A of the Code for Seismic Design of Buildings (2016 Edition) (GB50011-2010) and the Earthquake Parameter Zoning Map of China (GB18306-2015), the basic seismic intensity of Fangchenggang City, where the project is located, is 6 degrees, the design basic seismic acceleration is 0.05g, the design seismic grouping is Group I and the characteristic period value is 0.35s.

99. **Climate.** Fangchenggang is in a southern subtropical monsoon climate zone. The climate is warm in winter and rainy and hot in summer. The average annual temperature is 21.8℃~22.5℃, the average annual humidity is 82%, and the average annual rainfall is 2823mm. From June to October every year, the city is controlled by tropical high pressure, and typhoons, and tropical storms occur 4-5 times a year, sometimes up to 6-7 times.

100. The usual wind direction in the region is northeast, with a frequency of 30.5%. The harbor is surrounded by mountains and the wind is not strong, with an average wind speed of 5m/s over the years and a strong wind speed of 20m/s in general.

101. Located at a low latitude, Fangchenggang is under the combined influence of the ocean and mountains, which makes rainfall more abundant. Precipitation in the area is mainly concentrated from June to September each year, accounting for about 71% of the annual precipitation. The maximum annual precipitation is 3,111.9 mm, the minimum annual precipitation is 1,745.6 mm and the average annual precipitation is 2823 mm.

102. **Water resources.** Fangchenggang is rich in water resources, with an average annual rainfall of 2,823mm and an average of 176 days of rain per year. There are rivers such as the Fangcheng River, Beilun River, Ming River and Maoling River in the territory.

103. **Marine resources**. Fangchenggang is the only ecological bay city with full seascape by the Beibu bay, with a coastline of 580 kilometers and a sea area of more than 40,000 square kilometers, which is one of the cleanest sea areas in China's coastal areas. The city's marine biological resources are rich and diverse, with more than 700 species of fish, shrimp, and crabs.

104. **Resources of Chinese medicinal materials**. With abundant sunshine and pleasant climate, Fangchenggang boasts a wide variety of wild animals and plants, as well as abundant resources of Chinese herbal medicine and marine medicinal organisms. According to the background survey statistics of Guangxi Medicinal Botanical Garden, there are 1,870 species of vascular plants belonging to 894 genera and 214 families with medicinal efficacy records.

2. Socioeconomic Conditions

105. **Economy**. Fangchenggang City achieved a gross regional product of 73.281 billion yuan in 2020, an increase of 5.1% over the previous year. Among them, the added value of the primary industry was 11.108 billion yuan, up 3.9%; the added value of the secondary industry was 34.807 billion yuan, up 6.8%; the added value of the tertiary industry was 27.366 billion yuan, up 3.2%. The contribution rates of the three industries to economic growth were 11.4%, 64.9% and 23.6% respectively, and the structure of the three industries was adjusted from 15.6:47.1:37.3 in 2019 to 15.2:47.5:37.3.

106. **Demography.** According to the seventh national census statistics, the city has a resident population of 1,046,068, with an average annual growth rate of 1.90%. Among them, 244,280 were in Port District, 390,961 in Fangcheng District, 194,774 in Shanxi County and 216,053 in Dongxing City. In terms of age composition, the population aged 15-59 was 646,792, accounting for 61.83%; the population aged 60 and above was 147,838, accounting for 14.13%, of whom 104,921 were aged 65 and above, accounting for 10.03%. Fangchenggang is a multi-ethnic area with a resident population of 438,656 people from various ethnic minorities, accounting for 41.93% of the population. Among them, the Zhuang population is 355,041, accounting for 33.94%; the Yao population is 48,011, accounting for 4.59%; and the Jing population is 25,973, accounting for 2.48%.

107. **Health care facilities**. At the end of 2019, there were 681 medical and health institutions in Fangchenggang. Among them, there are 16 hospitals (8 grade hospitals), 28 health centers, 4 maternal and child health centers, and 5 disease prevention and control institutions. At the end of the 2019, there were 6,280 health technicians, including 2,185 practicing physicians and 2,721 registered nurses. There are 2.3 practicing doctors and 2.8 registered nurses per 1,000 population (resident population). By the end of 2019, the number of beds in hospitals and health centers (including maternal and child health centers) was 4,182, an increase of 149. There are 4.3 beds in hospitals and health centers for every 1,000 people (permanent residents).

3. Environmental Baseline

108. The surrounding environment of Fangchenggang plot is shown in the satellite image and photos below. The east is the Xiwan Huannai Avenu, Xiwan Tourist Area and Zhenyuling village. The north is the Li Zitan Road. The south is the Cultural Palace for Workers of South China Federation of Trade Unions that is under construction. Total of 295.25 mu forest land, including 260.44 mu planted eucalyptus and pine trees forest, and 33.81 mu green belt forest will be occupied. No documented protected species in the Fangchenggang subproject area.

109. No protected or physical culture resources recorded in the plot or surrounding environment.

To the east of the project is Xiwan Huan Hai Avenue

Cultural Palace for Workers of South China Federation of Trade Unions (under construction)

Li Zitan road north of the project

Xiwan Tourist area to the east of the project

East of the project is Zhenyuling Village

Current status of the site

Figure IV-1: Surrounding environment of Fangchenggang plot

110. **Air quality.** According to the 2021 Fangchenggang Environmental Quality Annual Report released on the website of Guangxi Fangchenggang Bureau of Ecology and Environment on February 8, 2022, the concentrations of major air pollutants in 2021 (Table IV-1) all meet the requirements of the Class II of the Ambient Air Quality Standard (GB3095-2012).

Table IV-1:Environmental quality status of basic pollutants

Pollutants	Annual evaluation index	Class II of GB3095-2012 /(μg/m^3)	Current concentration /(μg/m^3)
SO_2	Mean annual mass concentration	60	9
NO_2	Mean annual mass concentration	40	15
CO	95th percentile on a 24-hour average	4mg/m^3	1.0 mg/m^3
$PM_{2.5}$	Mean annual mass concentration	35	26
PM_{10}	Mean annual mass concentration	70	49
O_3	Daily maximum 8h mean 90th percentile	160	112

111. The air quality at the nearest sensitive point, Xiwan Tourist Area, was monitored during February 23 to March 1, 2022. Xiwan Tourist Area is about 70 m east of the site.

112. As can be seen from the monitoring results (Table IV-2) that the NH_3 and H_2S meeting the standard limit value in Appendix D of Technical Guidelines for Environmental Impact Assessment-Atmospheric Environment (HJ 2.2-2018) and the concentrations of SO_2, NO_2, PM_{10}, $PM_{2.5}$, CO, and O_3 meeting the Class I standard of Ambient Air Quality Standard (GB3095-2012).

Table IV-2: Ambient air monitoring results-Fangchenggang

Pollutants	Average period	Monitoring concentration range (Unit: mg/m^3)	Evaluation standard (Unit: mg/m^3)
NH_3	H value	0.03 ~ 0.06	0.2
H_2S	H value	ND ~ 0.004	0.01

Pollutants	Average period	Monitoring concentration range (Unit: mg/m^3)	Evaluation standard (Unit: mg/m^3)
O_3	H value	11 ~ 13	/
SO_2	Daily average	0.018 ~ 0.028	0.05
NOx	Daily average	0.030 ~ 0.038	0.1
PM_{10}	Daily average	0.029 ~ 0.037	0.05
$PM_{2.5}$	Daily average	0.019 ~ 0.028	0.035
CO	Daily average	0.9 ~ 1.3	4
O_3	Daily average	0.062 ~ 0.078	0.1

Note: "ND" means that the analysis result is lower than the minimum detection limit of the method.

113. **Acoustic environment**. A total of 5 noise monitoring points were set up for acoustic environmental quality monitoring, including four at the site boundaries and one at Zhenyu Village (the environmental sensitive receptor). Continuous monitoring was performed for 2 days, once during the day and once at night. According to the Acoustic Environment Function Zoning of Fangchenggang City (2020-2025), the area where the project is located belongs to Class 2 acoustic environment function zone. The acoustic environment within 35±5m outside the red line of Lizitan Highway in the north of the project boundary shall be subject to the Class 4a standard of Acoustic Environment Quality Standard (GB3096-2008), and the sensitive points in surrounding areas shall be subject to the Class 2 standard of Acoustic Environment Quality Standard (GB3096-2008).

Table IV-3: Monitoring results of acoustic environment-Fangchenggang

Monitoring time / Monitoring stations	Monitoring results Unit: dB(A)				Applicable standard	
	February 23, 2022		February 24, 2022			
	Day	Night	Day	Night	Day	Night
N1 east boundary	54.6	46.5	55.1	45.5	60	50
N2 south boundary	51.2	40.2	52.1	41.2	60	50
N3 west boundary	48.8	39.9	48.0	38.8	60	50
N4 north boundary	53.6	42.5	54.6	40.1	70	55
N5 Zhenyu Village	49.2	40.6	50.1	41.5	60	50

114. According to the monitoring results of acoustic environment presented in Table IV-3 above, the daytime and night noise monitoring values of sensitive points in the field boundary and Zhenyulilng village meet the requirements of the standards of Acoustic Environmental Quality (GB 3096-2008) for Class 2 and Class 4a zones.

B. Guiyang

1. Physical Setting

115. **Location.** Guiyang is located in the central part of Guizhou Province, between 106°07 'to 107°17' east longitude and 26°11 'to 26°55' north latitude. Guiyang covers an area of 8,034 km^2, accounting for 4.56% of the total area of the province.

116. **Climate.** Guiyang is a subtropical monsoon warm and moist climate zone, due to the low latitude, high altitude, affected by the East Asian monsoon circulation. The annual dominant wind direction is northeast, south in summer and northeast in winter, with an average wind speed of 2.2m/s. The annual average temperature is 15.3℃, the annual extreme maximum temperature is 35.1℃, the annual extreme minimum temperature is –7.3℃, the annual average relative humidity is 78%, the annual average total precipitation is 1,129.5 mm, the annual average number of lightning days is 49.1, the annual average number of cloudy days is 235.1, and the annual average sunshine hours is 1,148.3. The number of snowfall days per year is low, averaging only 11.3 days.

117. **Topography.** The terrain of Guiyang city is high in the north and south, low in the middle, with typical plateau characteristics, with an average altitude of 1,250 meters; The terrain is diverse, with hills accounting for 35.3% of the total area.

2. Socioeconomic Conditions

118. **Demography.** Guiyang has jurisdiction over six districts of Guanshanhu, Yunyan, Nanming, Huaxi, Wudang and Baiyun, and three counties of Xiuwen, Xifeng and Kaiyang administer one county-level city of Qingzhen. According to the seventh national census bulletin of Guizhou Province, the permanent population of Guiyang is 5,987,018, including 3,061,169 males and 2,925,849 females. In the age structure, the proportion of 0-14 years old is 18.56%, the proportion of 15-59 years old is 68.14%, the proportion of over 60 years old is 13.3%, and the proportion of over 65 years old is 9.47%.

119. **Economy.** In 2020, the city's GDP reached 431.165 billion yuan, with a year-on-year increase of 5.0%. The added value of the primary industry was 17.831 billion yuan, up 6.4%; The added value of the secondary industry was CNY 155.259 billion, up 5.5%; The added value of the tertiary industry was CNY 258.75 billion yuan, up 4.4%.

120. **Health care facilities.** By 2020, Guiyang has 3,320 health institutions, including 193 hospitals, 151 community health service centers, 78 township health centers, 1,291 village clinics, 88 outpatient departments, 1,465 infirmaries, and 2 first-aid centers (stations). The total number of beds was 43,021, including 24,501 in public hospitals, 10,343 in social hospitals, 5,183 in traditional Chinese medicine hospitals, 4,342 in public specialized hospitals, and 4,375 in primary medical and health institutions. The number of health technicians was 56,865, including 20,687 practicing (assistant) physicians and 27,617 registered nurses.

3. Environmental Baseline

121. The site conditions of the Guiyang plot are show in the satellite image and photos below. The east of the plot is Erzhu road. The residential houses outside of the plot are abandoned and will be demolished. No vegetation coverage within the site. The Guiyang plot is about 800 m to the buffer zone of Baihua Lake drinking water protection area, and about 3 km to the grade I protection zone. Baihua Lake is also a scenic spot with an area of 83 km^2, which is about 2 km

west of the plot. There are no recorded physical resources in the project area.

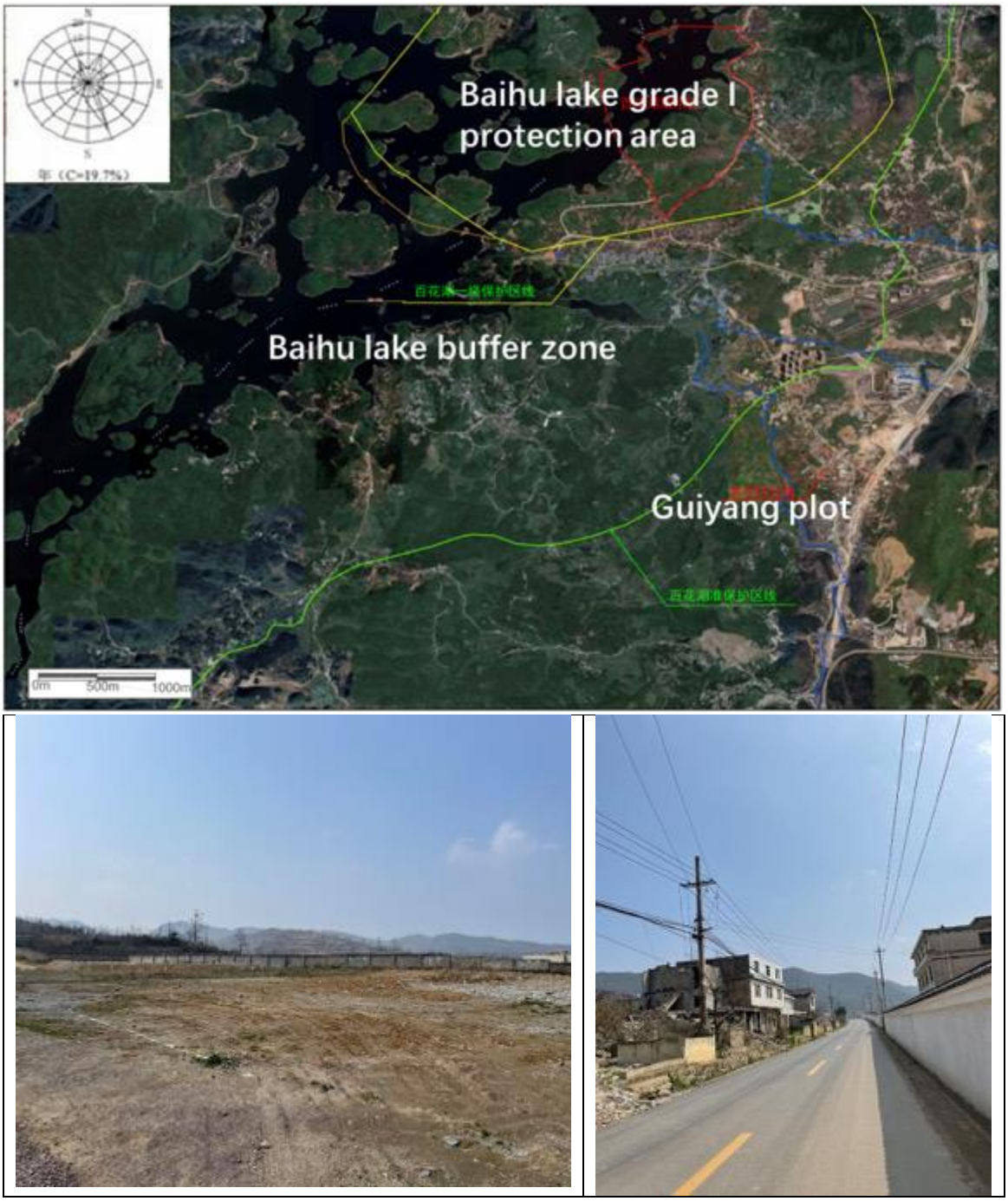
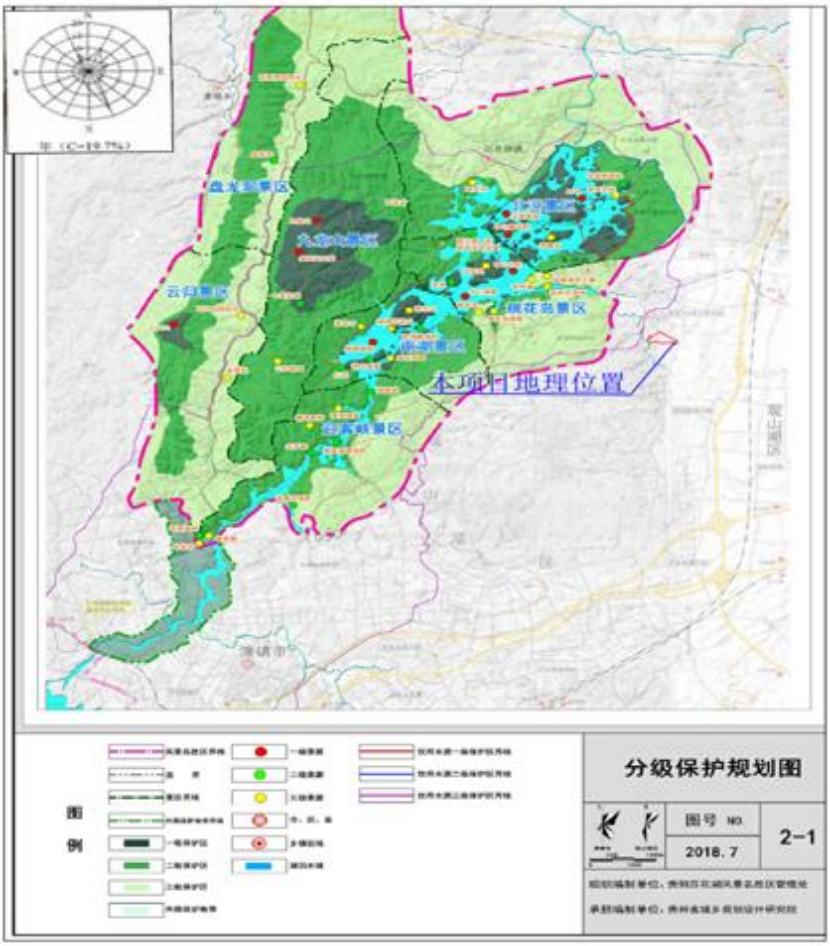


Figure IV-2: Site conditions of Guiyang plot



Note: the purple line is the boundary of Baihua lake scenic spot

Figure IV-3: Location of the Baihua lake scenic spot

122. **Air quality.** According to the "2020 Guiyang Ecological environment Status Bulletin" released by Guiyang Ecological Environment Bureau, Guiyang's environmental air quality reached the standard for 362 days, including 240 days of grade I (excellent), 122 days of grade II (good), and 4 days of grade III (mild pollution). There was no grade IV (moderate pollution) or worse than moderate pollution. The air quality was good. The average annual concentration of nitrogen dioxide was 0.018 mg/m^3; the average annual concentration of inhalable particulate matter was 0.041 mg/m^3; the average annual concentration of fine particulate matter was 0.023 mg/m^3, down 14.8% year-on-year; and the average annual concentration of sulfur dioxide was 0.010 mg/m^3. The average daily maximum 8-hour ozone concentration in the 90th percentile was 0.113 mg/m^3, while the average daily maximum 8-hour carbon monoxide concentration in the 95th percentile was 0.900 mg/m^3. The ambient air quality of Guiyang ranked 10th among 168 key cities and fourth among provincial capitals, further demonstrating its superiority in ambient air quality.

123. **Surface water.** According to "2020 Guiyang City ecological environment status bulletin": Baihua Lake reached the Category II standard of Surface Water Quality (GB3838-2002).

124. **Acoustic environment.** There is no noise source in the Guiyang plot except for traffic noise from the small village road outside. The acoustic environment is good.

C. Yan’an

1. Physical Setting

125. **Location.** Yan'an city is located in the southern half of northern Shaanxi, between 35°21 '~ 37°31' north latitude and 107°41 '~ 110°31' East longitude, belonging to the plateau continental monsoon climate. It borders Yulin city in the north, Xianyang City, Tongchuan City and Weinan City in the south, faces Linfen city and Luliang City of Shanxi Province across the Yellow River in the east, and is adjacent to Qingyang City of Gansu Province by Ziwuling Mountain in the west.

126. **Climate.** Yan'an is a warm-temperate semi-humid and arid climate zone, where climate changes throughout the year are governed by monsoonal circulation. Yan'an has a spring season from March to May, a summer season from June to August, an autumn season from September to November and a winter season from December to February.

127. The spring season is dry with little rain, the temperature rises rapidly with gusty winds and sandy weather. The average temperature in March is 4.5°C and 16.9°C in May, with a maximum of 36.5°C. In the event of strong cold air, the minimum temperature can drop to around 0°C and frost can occur. The summer is hot and rainy, with a seasonal precipitation of 312.3 mm, accounting for 57% of the annual total, mostly in the form of showers, sometimes accompanied by hail. The autumn season is rapidly cooling and wet, with many rainy and foggy days, 11-12 days of precipitation in September, half of the year's fog days in September-October, first frosts in late September to early October, and soil freezing in early November.

128. Rain and snow are scarce in winter, with more north-westerly winds and only 13 mm of precipitation during the season, accounting for 4% of the annual total. January is the coldest month, with an average temperature of –6.4°C and an extreme minimum of –25.4°C. Relative humidity averages 54%-60%.

129. Precipitation in Yan'an is mostly concentrated in the summer, with heavy and intense rainfall, accounting for only 29% of the annual total from October to May.

130. **Topography.** Yan'an is located in the middle reaches of the Yellow River and belongs to the Loess Plateau hilly and ravine area. The landscape of Yan'an is dominated by the Loess Plateau and hills. The terrain is high in the northwest and low in the southeast, with an average altitude of about 1200m. The highest point is at the top of Baiyu Mountain in Wugucheng Township, Wuqi County, with an altitude of 1,809.8 m; the lowest point is at Jiyi Township, Yichuan County, with an altitude of 388.8m, with a relative height difference of 1421m. The north is dominated by loess mountains and gullies, accounting for 72% of the total area; the south is dominated by Loess Plateau gullies, accounting for 19% of the total area.

2. Socioeconomic Conditions

131. **Economy.** In 2020, The gross regional product (GDP) of Yan'an city reached CNY 160,148 billion, down 0.8% from the previous year. The added value of the primary industry was CNY 19.041 billion, up 4.2%; The added value of the secondary industry was CNY 88.572 billion yuan, down 3.1%. The added value of the tertiary industry was CNY 52.535 billion, up 1.4%. The composition of the three industries was 11.9:55.3:32.8. The added value of the non-public sector reached CNY 46.396 billion, accounting for 29.0% of GDP.

132. **Demography.** According to the seventh census data, the permanent population of Yan'an

is 2,282,581, an increase of 4.37% compared with 2010. In the city's permanent population, the population living in cities is 1,400,750 people, accounting for 61.37%. The population living in the countryside was 881,831, accounting for 38.63%. Compared with the sixth national census in 2010, the urban population increased by 343,461, the rural population decreased by 247,889, and the proportion of urban population increased by 13.03%.

3. Environmental Baseline

133. The site of the Women and Children's Branch of the Yan'an Hospital is generally flat. The site is next to the Cuiyuan campus of Yan'an University. Yan River is about 80 m west of the site. Yangjiawan village is in the 60 m northwest of the plot. The site was cleared when constructing two buildings for Yan'an University so currently there is no vegetation on-site.

Original teaching building and comprehensive building

Construction camp within the plot

Cuiyuan campus of Yan'an University

Yan River

Vacant land in the west

Yanda road and Yangjiawan village

Figure IV-4: Site conditions of Yan'an plot

134. Shaanxi Zhongbang Environmental Protection Testing Technology Co., Ltd. is entrusted to monitor the environmental quality of air, surface water and sound of the subproject of Yan'an.

135. **Air quality.** The Yan'an site is located in the northwest of the south block of Cuiyuan Campus of Yan'an University, Baota District, Yan'an city, Shaanxi Province. According to the atmospheric function zoning, the site of the project is a class II functional area, and the ambient air quality standard complies with the requirements of the Class II Ambient Air Quality Standard (GB3095-2012).

136. According to "Technical Guidelines for Environmental Impact Assessment-Atmospheric Environment" (HJ2.2-2018), data or conclusions in environmental quality announcements or environmental quality reports published by national or local ecological environment authorities in the evaluation base year shall be preferentially used for the data of environmental quality status of basic pollutants. This project uses the monitoring results of six conventional pollutants in the air quality of Baota District from January to December 2021 in Shaanxi Province environmental Protection Bulletin December 2021 and January to December 2021 issued by Shaanxi Provincial Department of Ecology and Environment office on January 13, 2022, to analyze the current situation of regional environmental air quality. The mean values of $PM_{2.5}$, PM_{10}, NO_2, SO_2, CO, and O_3 (as shown in Table IV-4) all meet the requirements of class II standard limits in Ambient Air Quality Standard (GB3095-2012).

Table IV-4: Ambient air quality of Baota District, Yan'an (2020)

Serial number	Indicators	Annual average concentration	Secondary standard	Account for the rate / %
1	PM_{10} (ug/m^3)	57	70	81.43
2	$PM_{2.5}$ (ug/m^3)	26	35	74.29

Serial number	Indicators	Annual average concentration	Secondary standard	Account for the rate / %
3	SO_2 (ug/m^3)	5	60	8.33
4	NO_2 (ug/m^3)	32	40	80.0
5	95^{th} percentile concentration of CO (mg/m^3)	1.4	4	35.0
6	O_3 90^{th} percentile concentration (ug/m^3)	140	160	87.5

137. In addition, the NH_3, H_2S, and odor concentration were monitored at the plot and the Cuiyuan campus, which is at the downwind direction of the site. The monitoring was conducted from January 1, 2021 to 1-July 7, 2021 for 7 consecutive days. The monitoring frequency was 4 times a day, and the hourly average concentration was taken. The monitoring periods were 2, 08, 14 and 20 hours, respectively.

138. The monitoring results of typical pollutants were shown in Table IV-5, showing that the NH_3, H_2S met the requirements of Appendix D of Technical Guidelines for Environmental Impact Assessment - Atmospheric Environment (HJ2.2-2018).

Table IV-5: Monitoring results of typical air pollutant of Yan'an plot

Monitoring point	Pollutants	Date	Evaluation criteria (mg/m^3)	Monitoring concentration range (mg/m^3)	Maximum concentration and standard ratio (%)
Yan'an plot	NH_3	2021.9.1	0.2	0.031-0.036	18
		2021.9.2		0.029-0.034	17
		2021.9.3		0.033-0.037	18.5
		2021.9.4		0.032-0.037	18.5
		2021.9.5		0.036-0.041	20.5
		2021.9.6		0.036-0.032	16
		2021.9.7		0.027-0.033	16.5
	H_2S	2021.9.1	0.01	0.003-0.006	60
		2021.9.2		0.004-0.007	70
		2021.9.3		0.004-0.007	70
		2021.9.4		0.005-0.008	80
		2021.9.5		0.003-0.007	70
		2021.9.6		0.002-0.006	60
		2021.9.7		0.003-0.006	60
	Odor	2021.9.1	/	< 10	/
		2021.9.2		< 10	/
		2021.9.3		< 10	/
		2021.9.4		< 10	/

Monitoring point	Pollutants	Date	Evaluation criteria (mg/m^3)	Monitoring concentration range (mg/m^3)	Maximum concentration and standard ratio (%)
		2021.9.5		< 10	/
		2021.9.6		< 10	/
		2021.9.7		< 10	/
Cuiyuan Campus, Yan 'an University	NH_3	2021.9.1	0.2	0.025-0.030	15
		2021.9.2		0.028-0.033	16.5
		2021.9.3		0.028-0.034	17
		2021.9.4		0.023-0.028	14
		2021.9.5		0.026-0.035	17.5
		2021.9.6		0.033-0.040	20
		2021.9.7		0.023-0.030	15
	H_2S	2021.9.1	0.01	0.004-0.006	60
		2021.9.2		0.005-0.007	70
		2021.9.3		0.004-0.008	80
		2021.9.4		0.003-0.007	70
		2021.9.5		0.002-0.006	60
		2021.9.6		0.003-0.006	60
		2021.9.7		0.003-0.006	60
	Odor	2021.9.1	/	< 10	/
		2021.9.2		< 10	/
		2021.9.3		< 10	/
		2021.9.4		< 10	/
		2021.9.5		< 10	/
		2021.9.6		< 10	/
		2021.9.7		< 10	/

139. **Surface water**. Two sections are set at 500m upstream and 1000m downstream of the Yanhe River for continuous 3 days. The monitored indicators included pH value, chemical oxygen demand, 5-day biochemical oxygen demand, ammonia nitrogen, petroleum, total phosphorus, sulfide and volatile phenol, etc. 8 items.

Table IV-6: Statistical table of surface water monitoring results Unit: mg/L

Monitoring point location and time		pH	COD	BOD_5	Ammonia nitrogen	Petroleum	Total phosphorus	Volatile phenol	Sulfide
Class III standard		6 ~ 9	<20.0	<4.0	<1.0	<0.05	<0.2	<0.005	<0.2
	2021.9.1	8.12	17	3.4	0.166	0.02	0.16	0.0027	ND

Monitoring point location and time		pH	COD	BOD_5	Ammonia nitrogen	Petroleum	Total phosphorus	Volatile phenol	Sulfide
1# Yanhe upstream 500m section	2021.9.2	8.10	15	3.1	0.184	0.03	0.17	0.0027	ND
	2021.9.3	8.15	14	2.9	0.207	0.02	0.14	0.0025	ND
2# 1000 m downstream Yanhe River	2021.9.1	8.14	18	3.5	0.282	0.03	0.19	0.0032	ND 0.005
	2021.9.2	8.11	17	3.3	0.245	0.03	0.18	0.0034	ND 0.005
	2021.9.3	8.13	16	3.1	0.254	0.04	0.15	0.0032	ND 0.005

140. The monitoring results (Table IV-6) showed that all monitoring sections of the project met the Class III of Surface Water Environmental Quality Standard (GB3838-2002).

141. **Acoustic environment**. Total of 7 monitoring points were arranged for acoustic environment, namely 1# northeast of the site boundary, 2# southeast of the site boundary, 3# southwest of the site boundary, 4# northwest of the site boundary, 5# Cuiyuan Campus of Yan 'an University, 6# Lanjiping Village, and 7# Yangjiawan Village. The monitoring time was from 1 January 2021 to 2 September 2021 for 2 days, 6:00-22:00 in the day and 22:00-6:00 in the night, and the equivalent continuous sound level was monitored once for each site.

Table IV-7: Acoustic environment monitoring results-Yan'an

Monitoring location	Monitoring value Unit: dB (A)				Standard values Unit: dB (A)	
	2021.9.1		2021.9.2			
	day	The night	day	The night	Day	Night
1 #	52	45	53	46	70	55
2 #	52	45	51	45	60	50
3 #	50	43	51	44		
4 #	51	44	52	44		
5 #	52	45	53	45	60	50
6 #	53	46	52	45		
7 #	53	45	53	46		

142. As can be seen from the Table IV-7, the daytime and nighttime noise monitoring values of the southeast, southwest and northwest sides of the site boundary of the project and the monitoring points of sensitive targets all meet the Class 2 standard of Sound Environmental Quality Standard (GB3096-2008). The daytime and nighttime noise monitoring values of monitoring points at the northeast side of the site boundary of the project meet the Category 4 standard of Sound Environment Quality Standard (GB3096-2008), indicating that the sound environment quality around the Yan'an plot is good.

V. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Project Area of Influence and Sensitive Receptors

143. The project area of influence is defined as the total area which might be subjected to adverse impacts of the project. This is based on the locations of sensitive receptors, defined as settlements and/or environmental values that might be affected by the project construction and/or operation.

144. According to the Technical Guidelines for Environmental Impact Assessment-Acoustic Environment (HJ2.4-2009) and the Technical Guideline for Environmental Impact Assessment-Atmospheric Environment (HJ 2.2-2018), the acoustic environment protection targets and atmospheric environmental protection targets are the residents within 50 m of the site boundary and nature reserves, scenic spots, residential areas, cultural areas and residential areas within 500 meters of the boundary respectively. For ecological resources and health and safety, the influence area is the footprint of the project site. These distances, combined with the direct construction sites, were assumed to encompass the total project area of influence.

Table V-1: Identified Sensitive Receptors

Subproject	Sensitive Receptors	Population	Direction	Distance from the project site (m)
Fangchenggang	Zhenyuling village	200	East	90 m
	Xiwan tourism area	/	East	70 m
Yan'an	Cuiyuan campus of Yan'an University	8,000	East	30 m
	Yangjiawan Village	200	North	60 m
	Lanjiaping village	800	South	180 m
Guiyang	Baihu education center	Under construction	East	500 m

B. Anticipated Project Benefits and Positive Impacts

145. The project intends to improve health care facilities, procure new medical equipment, and increase the number of beds available, which will directly benefit people living in the project areas. The implementation of knowledge management in the participating hospitals and training of staff will increase the capacity in these participating hospitals and across the PRC. This will benefit a larger population. Additionally, training will be provided to the general public by health workers, which will particularly target the elderly, women, and vulnerable populations, and will increase the health of the local population through better understanding of disease symptoms, prevention, and treatments.

C. Impacts and Mitigation Measures during Design and Pre-Construction Phase

146. A number of environmental measures will be implemented in the design and pre-construction phase. These include:

(i) Design buildings in compliance with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50011-2010 (Building Seismic Design Code); GB 50016-2014 (Code of Design on Building Fire Protection and Prevention); GB 50189-2015 (Energy Conservation Design for Public Buildings), and other applicable national design codes. Parking garages and other underground structures are permitted to be constructed below design flood elevation.

(ii) Ensure no-use of VOC-emitting materials (including paints, coatings, adhesives, carpet and furniture's) to ensure high indoor air quality.
(iii) No asbestos or asbestos containing material in the project facilities.
(iv) Satisfy the "One Star" green building criteria defined in the GB/T50378-2019 (Green Building Evaluation Standard).
(v) Ensure the indoor noise comply with GB 50118-2010 (Code for Design of Sound Insulation of Civil Buildings).
(vi) The design and functional layout of health care buildings shall comply with the GB51039-2014 (Code for Architectural Design of General Hospital) and the WBG EHS Guidelines for Health Care Facilities that ensure: (a) separation of clean/sterilized and dirty/contaminated materials and people flows; (b) development and inclusion of adequate disinfection/sterilization procedures and facilities; (c) selection of heating, ventilation and air conditioning system that provide isolation and protection from airborne infections; (d) design of water systems to provide adequate supplies of potable water to reduce risks of exposure to waterborne pathogens; (e) provision of hazardous material and waste storage and handling area; and (f) selection of easily cleaned building materials that do not support microbiological growth, are slip-resistant, nontoxic, and nonallergenic, and do not include volatile organic compound emitting pains and sealants.
(vii) Institutional strengthening, including (a) appointment of PMO-EO; (b) hiring of LIEC within loan management consultant services by PMO; and (c) contracting of environmental monitoring station by the implementing agency (implementing agency) to conduct environment impact monitoring.
(viii) **Updating EMP.** Mitigation measures defined in this EMP will be updated based on final technical design. This will be the responsibility of PMO, with support of the local design institutes (LDIs).
(ix) **Contract documents.** Include EMP obligations in tender documents and specifications, referencing the EMP and monitoring plan. This will be the responsibility of the LDIs, with support of PMO and the LIEC.
(x) Safety measures for COVID-19. Prior to the arrival of external project personnel (e.g., workers and consultants), the PMO will implement safety procedures and screening to ensure that all staff are tested negative for COVID-19 and do not pose a threat to local human populations. This will include: (i) requirement that all project personnel are tested negative for COVID-19, (ii) external workers and consultants confirm their COVID-19-free status to PMO prior to arrival, and (iii) project safety and sanitation measures are distributed to all personnel and are included as contractual requirements for all staff.
(xi) **Public consultation.** PMO will hold public meetings with the support of the LIEC prior to construction to discuss the EMP, project activities, and issues associated with the safety of nearby communities in the vicinity of the construction sites.
(xii) **Environmental protection training**. The LIEC to provide training on implementation and supervision of environmental mitigation measures to contractors.
(xiii) **Grievance Redress Mechanism.** The GRM will be adjusted and/or confirmed, and made operational, prior to construction. This will be the responsibility of XPMO, with support of the LIEC.
(xiv) **Contractor Site-EMP.** Following the award of contracts of construction and CSFs, the contractor and the CSF will prepare a construction site environmental management plan (Site-EMP) and an environmental supervision plan (CSF-ESP) respectively, including an emergency preparedness and response plan for

construction emergencies and a site environmental health and safety plan, for clearance by the implementing agency.

D. Impacts and Mitigation Measures during Construction Phase

147. Building construction includes four stages: land leveling, foundation, main structural engineering, and interior decoration and exterior wall construction. Main impacts during construction, as well as mitigation measures, are discussed below. The total construction period of this project is about one to three years. The number of construction workers required, and construction period of each engineering subproject are indicated in **Table V-2**. The estimated working days are 330 days a year.

Table V-2: Number of Construction Workers and Construction Periods

Subproject	**Construction Period** (months)	**Construction Workers** (population)
Fangchenggang	30	100
Guiyang	30	100
Yan'an	12	50

1. Impacts on Soil

148. The construction sites for the health care and training facilities in three project cities targeted by the project are relatively small. The potential impacts on soil include (i) soil erosion, (ii) soil contamination, and (iii) inappropriate management of spoil disposal. The buildings will use reinforced concrete frame structure. As mixing concrete on-site will produce significant air and water pollution, the central government has prohibited mixing concrete on-site in urban area since 2004. The contractor will purchase ready-mixed concrete from existing concrete-mixing station so the project does not involve any associated quarries.

(i) **Soil erosion.** May be caused by construction, excavation, and borrow pits, stockpiles, and spoils from earthwork during construction of buildings and grading. The factors that are expected to contribute to accelerated erosion in the project area are winds and rainfall.

(ii) **Soil contamination.** Construction activities may pose the potential for release of petroleum-based products, such as lubricants, hydraulic fluids, or fuels during their storage, transfer, or use in equipment.

(iii) **Soil borrow and spoil disposal.** No borrowed soil is required for all three sites. Total of 99,600 m^3, 9174 m^3 and 61,113 m^3 surplus spoil will be generated from Guiyang, Fangchenggang and Yan'an respectively. The spoil will be re-used to the extent possible, for (i) the other project works and construction activities in each city, pending the guidance and approval of the local Urban Administration Bureau (whose responsibilities include the allocation and management of surplus spoil). The local Urban Administration Bureau will designate the locations of reuse to minimize the transportation distance and avoid the transportation routes crossing the urban area. In the event that surplus spoil cannot be re-used and must be disposed of, the disposal sites will be designated by the local Urban Administration Bureau prior to construction.

149. The impacts on soil will be mitigated through a number of remedial measures which are defined in the EMP, which shall be defined in construction contracts and the site-EMPs, to be developed by contractors:

(i) **For soil erosion protection.** (a) Prepare soil erosion control plan (showing how

runoff will be controlled at site perimeter to control soil and water runoff, and how disturbed areas will be reclaimed; (b) minimize active open excavation areas; (c) construct intercepting ditches and drains to prevent runoff entering construction sites, and divert runoff from sites to existing drainage; (d) stabilize all earthwork disturbance areas within maximum 14 days after earthworks have ceased; and (e) properly slop and re-vegetate disturbed surface.

(ii) **For soil contamination prevention.** a) Store chemicals and hazardous products and waste on impermeable surfaces in secure, covered areas; (b) remove all construction wastes from the site to approved waste disposal sites; (c) provide spill cleanup measures and equipment at each construction site; and (d) conduct training in emergency spill response procedures.

(iii) **For soil contamination prevention.** Spoil management plan to be prepared by contractors for safe disposal of the construction spoil.

2. Wastewater Management

150. **Domestic wastewater**. For Yan'an, the subproject will not set up construction camp on-site. The contractor will rent residential house in the Yangjiawan village nearby. The domestic water consumption of the construction personnel is 40L/person/d, the sewage generation coefficient is 0.8, and the construction peak personnel are 50 people/d, the domestic sewage discharge is about 1.6 m^3/d. There main pollutants from domestic sewage are COD, SS, and ammonia nitrogen. Temporary septic tanks will be set up at the construction site, which will be regularly cleared for farmland fertilization.

151. For Fangchenggang, construction camp will be set up on-site. The domestic water consumption of the worker is calculated as 150L/person per day. During the peak construction period, there will be about 100 workers. The water consumption is about 15 m^3/d, and the wastewater consumption is calculated as 80% of the water consumption, which is about 12 m^3/d. The domestic sewage is discharged into the septic tank, and after being treated in the septic tank, it is discharged into the municipal sewage pipe network. The Xiwan WWTP will be in operation that can receive the wastewater from the project.

152. For Guiyang, during the peak construction period, there will be about 100 workers. One construction camp will be set on-site. The domestic sewage amount is about 12 m^3/d which will be discharged into the municipal sewage network and treated by Jinbai WWTP.

153. **Construction wastewater** is mainly from drainage of foundation and bored pile, construction maintenance, equipment cleaning, and vehicle flushing. The main pollutants are petroleum and SS. The concentration of petroleum is about 10 to 30 mg/L. The concentration of SS can be as high as 1,000 mg/L. If such wastewater is discharged without treatment, it will block the sewers and cause damage to the sewer system in the surrounding areas. Construction wastewater will be discharged into the municipal sewage network after being settled through the temporary sedimentation tank. After pretreatment the supernatant can be reused and sprayed on the exposed topsoil to suppress dust.

3. Impacts on Air Quality

154. The pollution sources which affect the air quality during construction period mainly come from the fugitive dust generation in and around the proposed sites, the exhaust gas of transportation trunks and construction machinery (gaseous CO, CH, and NO_2) and decoration.

155. The quantity of dust generated will depend on wind, humidity of the material and earth, and state of site. For the project area, it is estimated that under general on-site conditions (average wind speed 2.5 meters per second, and average humidity of 80%) dispersion distance is 100 m downwind if not taken mitigation measures. For dust generated by transporting earth and other construction materials, the impact zone may exceed 60 m each side of the route. The Zhenyuling village, Xiwan tourism area, Cuiyuan campus of Yan'an University, and Yangjialing village are within 100 m of the construction sites, where might be affected if not taken any mitigation measures.

156. The following measures will be taken to control fugitive dust from the construction site:

(i) Dust-prone materials such as residual soil and sand at the construction site shall be covered with dust-proof nets (cloths) and sprayed. Cement and other fine materials shall be stored in the warehouse or fully covered. The loading height of residual soil, sand, and construction waste shall not exceed the guardrail of the vehicle.
(ii) Install perimeter fences at each site prior to construction. The fence shall be at least 2m high.
(iii) Spray water at least twice a day where fugitive dust is generated.
(iv) Cover trucks carrying earth, sand or stone with tarps or other suitable covers to avoid spilling and dust generation.
(v) Undertake regular air quality monitoring in around the construction site in accordance with the monitoring plan.
Regularly consult the nearby residents to identify concerns and implement additional dust control measures, as necessary.

4. Impacts on Acoustic Environment

157. The major sources of noise pollution are movement of construction vehicles, the haulage of construction materials to the construction sites and the noise generating activities at the sites. Concrete-mixing and material movements are the primary noise generating activities and will be uniformly distributed over the entire construction period. The noise value of the main equipment during the construction period is shown in **Table V-3** and the noise value of the transport vehicle is shown in **Table V-4**.

Table V-3: List of Major Equipment Noise Strength during Construction Period

Construction Stage	**Noise Source**	**Sound Strength** (dB)
Drainage pipeline construction	Excavators, tower cranes	78–90
Foundation construction	Drill, diesel generator	75–100
Structural construction	Vibrating rod, tower crane, diesel generator	75–100
Equipment installation	Crane, hoist, diesel generator	68–100
Exterior wall decoration	Knocking, electric drill, cutting machine	80–90

Table V-4: List of Transport Vehicle Noise Source Strength

Construction Stage	**Materials Transported**	**Vehicle Type**	**Sound Strength** (dB)
Foundation and structural construction	Reinforced concrete, commercial concrete	Concrete tanker, truck	80–90
Decoration	Various decoration materials and necessary equipment	Light truck	75

158. Construction activities are expected to produce noise levels in the range of 68-100 dB(A).

The noise level at 5m outside the construction site is about 87 dB(A) during peak hours, and 78 dB(A) during non-peak hours. The predicted noise level without considering obstacles (such as field walls and trees, etc.) is provided in **Table V-5**.

Table V-5: Construction Noise Impact Prediction Results

Distance (m)	5	10	20	30	40	50	80	100	110	130	150	200
Peak hours (dB(A))	87	81	75	71	69	67	63	61	60	59	57	55
Non-peak hours (dB (A))	78	72	66	62	60	58	54	52	51	50	48	46
Noise Emission Standard for Construction Site Boundary (GB12523-2011): 70 dB(A) during daytime and 55 dB(A) during nighttime.												

159. In the peak hours, when the distance from the construction site boundary is more than 40 m, the construction noise can meet the requirement of 70 dB(A) sets out in the Noise Emission Standard for Construction Site Boundary (GB12523-2011), but it does not meet the 55 dB(A) at night. When the distance from the construction site is 200 m, the construction noise can meet the standard requirements of daytime and nighttime. Under normal circumstances, when the distance is greater than 80 m, the construction noise can meet the standard requirements of daytime and nighttime. The Zhenyuling village, Xiwan tourism area, Cuiyuan campus of Yan'an University, and Yangjialing village and Lanjiaping village are 30-180 m of the construction sites, where might be affected if not taken any mitigation measures.

160. Noise will be mitigated through a number of remedial measures which are defined in the EMP, which shall be defined in construction contracts and the site-EMPs, to be developed by contractors:

(i) Maintain equipment and machinery in good working order, undertake regular equipment maintenance, and ensure compliance with the PRC standard of GB12523-2011.

(ii) Operate between 07:00H-20:00H only and reach an agreement with implementation agencies management and nearby residents regarding the timing of heavy machinery work, to avoid any unnecessary disturbances; and nighttime[12] works should only be conducted in exceptional cases, and a permit should be obtained for that purpose.

(iii) Inform potentially affected people. including students, staff, and nearby residents in advance.

(iv) Install temporary anti-noise barriers to shield school buildings where noncompliance with Category 2 in Environmental Quality Standards for Noise (GB3096-2008) is anticipated/monitored.

(v) Locate sites for concrete-mixing and similar activities at least 300 m from sensitive areas, if without any mitigations.

(vi) Monitor/observe noise within campus and at nearby sensitive areas at regular intervals (as defined in the monitoring plan).

Seek suggestions from potentially affected sensitive receptors and consult with the to reduce noise annoyance.

(vii) Disseminate information on procedure of handling complaints through the GRM.

161. Noise impacts during construction would be of short duration. Potential sensitive receptors will be exposed to short-term, temporary, and localized impacts. With above mitigation measures

[12] According to the article 88 of the Noise Pollution Prevention and Control Law of PRC (2022), nighttime refers to the period between 22 pm to 6 am.

in place, potential noise impacts during construction would be reduced to the level within the standards (GB12523-2011).

5. Vibration

162. The principal source of vibration is the operation of machineries during foundation preparation. Buildings around the proposed sites will be classified, according to their sensitivity to vibration damage, with the categories including low, medium, and high-risk buildings. From the study it is found that buildings/structures within 4.5 m from sites will have major impact of vibrations due to foundation work, as per BS 7385/DIN 4,150 standards. There is no other structures/buildings within 500 m for Guiyang plot, 200 m for Fangchenggang plot and 30 m from Yan'an plot. As the receptors are away from the proposed sites the sensitive receptors will encounter low impact of vibrations due to construction equipment.

163. **Mitigation measures.** For the structures close to the construction sites, suitable mitigation measures should be adopted to minimize the vibration levels. In case any structure is weak, a pre-construction survey of the building shall be done in detail by the contractor, witnessed by the supervision engineer as well as the property owner. Signed documents and photographic records will be kept as evidence to protect both the owner as well as the project from spurious claims.

164. A wave barrier is typically a trench, or a thin wall made of sheet piles or similar structural members. The purpose of a barrier is to reflect or absorb wave energy, thereby reducing the propagation of energy between a source and a receiver. The depth and width of a wave barrier must be proportioned to the wavelength of the wave intended for screening.

165. Adverse human response to construction vibration can be mitigated by good communication between the contractor and local residents. If occupiers of dwellings are informed of their nature, duration, and potential vibration effects prior to the works, then adverse response will be less. Generally, the main concern relating to construction vibration is of damage to property and if this is not likely to occur, then this point should be made clear to residents.

6. Solid Waste

166. Inadequate disposal of construction wastes could have adverse impacts on soil, water, and health of workers and the community. Waste streams will include inert construction and demolishing wastes (soil, debris, concrete, etc.), municipal-type wastes (construction workers' food and packaging wastes from construction consumables), and hazardous wastes (fuel containers, oil filters, oily rags, etc.). According to the FSR, all excavated earth and stones could be used for backfilling on-site.

167. During the construction process, 0.3t of construction waste will be generated per 100 m^2 of construction area. The construction area of the Fangchenggang subproject is about 67,394.89 m^2, so the amount of construction waste generated from Fangchenggang is estimated to be 202.18t; the domestic waste is calculated as 1kg/d/person, and the construction peak period is calculated as 100 workers, and the amount of domestic garbage generated is 100kg/d.

168. The Guiyang subproject will demolish 7,399.4 square meters of masonry houses, generating approximately 8,879.28 tons of demolish waste. Based on the site inspection conducted by the EIA institute and TRTA environmental consultant, it is unlikely that the demolition construction waste contains asbestos materials. To ensure that no work or community hazards exist on site before work commences, a survey of the building to be demolished will be undertaken

to discover and report on the presence or absence of asbestos or asbestos-containing materials. Where asbestos or asbestos containing material is found, the implementing agency of Guiyang subproject will engage services of certified agency capable to handle and disposal asbestos containing materials to safely remove the material before work commences in accordance with international best practices[13]. The construction of the Guiyang TCM hospital with total floor area of 107,670 m^2 will generate 323 t construction waste.

169. The Yan'an subproject involves construction of a new complex building (58927m^2) and decoration of two existing buildings, the total amount of construction waste is about 294.6t.

170. The main components of construction waste are soil, muck, scrap steel, scrap iron wire and various scrap steel fittings, metal pipeline scrap, waste bamboo and wood, shavings, scattered mortar and concrete, broken bricks, and broken concrete blocks. The construction waste will be sorted on-site. The recyclable waste materials will be sold to recycling companies. The non-recyclable parts are transported to the slag yard designated by local construction bureaus.

171. The municipal solid waste from workers is about 100 kg/d, 100 kg/d and 50/kg for Guiyang, Fangchenggang and Yan'an respectively.

172. The construction sites are situated in the urban area that covered by existing sanitation collection system. The municipal solid waste generated by the project during construction is in small amount that will not increase the load of the existing facilities.

173. According to the local regulations on construction waste transportation and disposal, the contractor shall prepare a construction waste disposal plan prior to construction commencement. The construction waste disposal plan shall include the following contents: (i) planned production volume and classified reduction measures of construction waste; (ii) construction waste transportation, basic information of consumption unit, transportation route, and disposal time; and (iii) construction waste transportation, special budget for disposal expenses, and information on expenditures. In addition, the following waste management and impact mitigation measures have been defined in the EMP, which shall be defined in construction contracts and the site-EMPs, to be developed by contractors:

(i) Maximize reuse/recycling of construction and deconstruction wastes (e.g., iron, bricks, windows, doors, steel bars, etc.).
(ii) Provide appropriate waste storage containers for workers' municipal garbage and hazardous wastes.
(iii) Install confined storage points of solid wastes away from sensitive receptors, and regularly haul to an approved disposal site.
(iv) Use licensed contractors to remove wastes from the construction sites.
(v) Prohibit burning of waste.

7. Impacts on Flora and Fauna

174. The three project sites are in the built-up area. No vegetation coverage in the Yan'an plot and Guiyang plot. Fangchenggang plot will occupy 260.44 *mu* planted eucalyptus and pine forest, and 33.81 *mu* green belt forest. Field investigations have established that there are no threatened or endangered flora and fauna species within the project's direct area of influence. Therefore, no

[13] Good practice Guidance for the Management and Control of Asbestos (2022), ADB. https://www.adb.org/publications/good-practice-management-control-asbestos

adverse impact on such species is likely to occur during the construction activities. Total of CNY1.3 million compensation have been paid by the Fangchenggang executing agency. The local Fangchenggang Forestry Bureau will replant no less than 294.25 *mu* of forest land according to the Forestry Law of PRC (2012). All sites will be re-vegetated after construction.

8. Loss of Physical Cultural Resources

175. There is no record of important heritage or archaeological sites on the 3 subprojects. Contractors will be required to establish chance-find procedure for physical cultural resources. If a new site is unearthed, work will be stopped, and the implementing agency and local cultural relics bureau notified.

9. Risks to Community Health and Safety

176. Construction sites will be located close to existing buildings and residential areas, representing a potential risk to public health and safety, especially to students and staff. This risk will be mitigated through a number of measures defined in the EMP, which shall be defined in construction contracts and the site-EMPs, to be developed by contractors:

(i) Prepare traffic control plan within and around campuses during construction, to be approved by institutions' management, and local traffic management administration before the startup of construction. The plan shall include provisions for diverting or scheduling construction traffic to avoid peak traffic hours, main teaching activities, such as exams, and regulating traffic at road crossings with an emphasis on ensuring public safety through clear signage.
(ii) Designate staff members to control traffic during peak hours.
(iii) Ensure that all sites are secure, discouraging access through appropriate fencing; place clear signs at construction sites in view of the people at risk (including students, staff, and nearby communities), warning people of potential dangers such as moving vehicles, hazardous materials, excavations, and raising awareness on safety issues.
(iv) Return machinery to its overnight storage area/position.
In collaboration with the institutions' management, hold a public meeting prior to commencing construction to discuss issues associated with ensuring the safety of students and staff, as well as nearby communities in the vicinity of the construction site.

10. Occupational Health and Safety

177. The construction camp will be set within the subproject plots of Guiyang, Fangchenggang and Yan'an. The leading safety hazards on-site are falls from height, excavation accidents, electrocution, and being hit by falling objects. The following measures have been defined in the EMP to ensure high level of occupational health and safety, which shall be defined in construction contracts and the site-EMPs, to be developed by contractors:

(i) Appoint one staff to implement and supervise the implementation of the site-EMP and the performance of subcontractors.
(ii) The conditions of the construction camp shall meet with the requirements of Construction Site Environment and Hygiene Standards (JGJ 146-2013) and Workers' Accommodation: Processes and Standards of World Bank Group[14].
(iii) Provide safe supply of clean water and an adequate number of latrines and other

[14] Workers' Accommodation: Processes and Standards (ifc.org)

sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained in a hygienic state.

(iv) Provide garbage receptacles at construction site.

(v) Provide personal protective equipment for workers in accordance with relevant health and safety regulations.

(vi) Develop an emergency response plan to take actions on accidents and emergencies; document and report occupational accidents, diseases, and incidents; and organize fully equipped first-aid base at each construction site.

(vii) Establish records management system that will store and maintain easily retrievable records on occupational accidents, diseases, and incidents.

(viii) Train all construction workers in basic sanitation and hygiene issues, general health in basic sanitation and hygiene issues, general health and safety matters, and on the specific hazards of their work.

(ix) Posters drawing attention to on-site safety, rescue, and industrial health regulations shall be made or obtained from the appropriate sources and will be displayed prominently in relevant areas of the site.

(x) **COVID-19 health and safety plan.** The project EMP includes a COVID-19 health and safety plan to address COVID-19 health risks. The plan will be prepared in line with government regulations and guidelines on COVID-19 prevention and control, and in consultation with public health agencies in the area. The plan will include (a) measures to record the locations that workers have visited/lived immediately before and during project work; (b) schedules for disinfecting/cleaning offices, yards, stores and labor camps; (c) measures to implement temperature checks and other health checks on-site; (d) physical distancing measures, particularly in worker camps; (e) requirements for mandatory use of personal protective equipment such as facemasks, and provision of handwashing stations, hand sanitizers, and other appropriate protective measures; (f) how workers and residents living near project sites will be provided with information to protect themselves from COVID-19; (g) procedures to be adopted in the event a worker is suspected of having contracted COVID-19; and (h) other COVID-19 prevention and control measures appropriate for the local context.

11. Utilities Provision Interruption

178. At the construction sites, construction activities may require relocation of local municipal utilities such as power, water, sewers, and communication cables. Contractors will be required to assess potential disruption to services and identify risks before starting construction. If temporary disruption is unavoidable, contractors will develop a plan to minimize the disruption and communicate the dates and duration in advance to all affected people, in conjunction with the institution management.

E. Impacts and Mitigation Measures during Operation Phase

1. Wastewater Management

179. The domestic sewage mainly includes the administrative management and medical staff of the project facilities, the flushing water generated by the elderly housing, the washing water, the shower water, the kitchen oily wastewater, etc. The main pollutants are COD_{Cr}, BOD_5, SS, NH_3-N, and vegetable oil, etc. Central air conditioning cooling water will be recycled. Medical sewage mainly includes wastewater discharged from medical treatment rooms. The pollutants

contained in medical sewage mainly include COD_{Cr}, BOD_5, SS, NH_3-N, and microorganisms such as bacteria and pathogens.

180. The wastewater generated is calculated as 80% of water consumption. Water consumption of the proposed project is estimated according to the water quota in the Code for Design of General Hospitals (GB51039-2014) and the Code for Design of Building Water Supply and Drainage (GB 50015-2003 (2009 Edition)).

181. For Fangchenggang, the wastewater volume of the TCM Health Management Center is 34.07m3/d (12,436.86 m3/a). The pollutant concentration is CODCr: 300mg/L, BOD5: 150mg/L; SS:120mg/L; Ammonia nitrogen: 45mg/L; fecal coliforms: 1.8×10^7/L. The medical wastewater will be pre-treated by the station constructed with the Fangchenggang TCM Hospital Relocation Project (Phase I). The treatment process is "secondary treatment + chlorine tablet disinfection process." Therefore, the wastewater of outpatients, domestic sewage of employees, and unforeseen wastewater of the TCM Health Management Center are collected by pipelines and directly discharged into the supporting sewage treatment station to meet the pretreatment requirement listed in Table 1 in the "Water Pollutant Discharge Standards for Medical Institutions" (GB18466-2005). After pretreatment on-site, the effluent will be discharged into the municipal sewage network and then treated by the Xiwan WWTP further treatment.

182. The wastewater volume of the ASEAN public health training base is 246.37m^3/d (61,593.2 m^3/a). The canteen wastewater is treated by the grease trap and discharged into the septic tank together with other domestic sewage for treatment then discharged into the municipal sewage pipe network, and finally discharged into the Xiwan WWTP for further treatment.

183. For Guiyang, the wastewater amount is about 635.544m^3/d, including the medical wastewater and domestic sewage. The wastewater will be pre-treated by septic tank and an 800 m3/d wastewater treatment station using chlorine dioxide disinfection process to meet the requirement of Discharge Standard of Water Pollutants in Medical Institutions (GB18466-2005) then discharged into Jinbai WWTP for further treatment.

184. For Yan'an, the wastewater includes medical wastewater (inpatient ward wastewater, outpatient wastewater), domestic wastewater from working staff and canteen wastewater, with an amount of 244.8 m^3/d (89,352 m^3/a). The pollutant concentration is: COD 369.5mg/L, BOD5 190.8 mg/L, SS 160.5mg/L, ammonia nitrogen 29.4 mg/L, oil 45.14 mg/L, fecal escherichia coli 1.6×10^8 MPN/L. The integrated buried sewage treatment station is located in the south of the rehabilitation and health complex building, covering an area of 170m^2. The designed treatment scale is 500m^3/d, and the septic tank + grid + regulating pool + contact pool + sodium hypochlorite disinfection process is adopted. After treated to standard limit of Table 2 in the Discharge Standard of Water Pollutants in Medical Institutions (GB18466-2005), the wastewater will be discharged by the municipal sewage pipe network to Yan 'an WWTP for further treatment.

2. Impact on Air Quality

185. The main sources of air pollution during the operation period are smell from the on-site sewage treatment stations of subprojects of Guiyang and Yan'an, cooking fumes and exhaust gas from parking lot.

186. **Cooking fumes from canteen**. The TEIA estimated the fume emission rate assuming the average per capita consumption of animal and vegetable oil of 0.15 kg/d and the canteen operated 6 hours per day. After purification by the cooking fume purification system with more than 85%

purification efficiency, the discharge concentration is low to 2 mg/m^3, which can meet the requirements of Standard of Dietetic Fume Emission (Trial) (GB18483-2001).

187. **Exhaust gas from the parking lot.** The underground garage will be equipped with mechanical ventilation. The air exchange frequency is more than 6 times/h through special exhaust vent. The pollutant emission concentration of underground garage involved in this project can be controlled within the limit standard of Table 2 of Integrated Emission Standard for Air Pollutants (GB16297-1996).

188. **Odor from the sewage treatment station**. The subprojects of Yan'an and Guiyang are installed with on-site medical wastewater treatment facilities. In the operation of the sewage treatment equipment, the odor pollutants are produced by the metabolism of microorganisms, protozoa, and micelles that can be a nuisance to workers and the surrounding community. The wastewater treatment stations are buried and the concentrations of NH_3 and H_2S at downwind direction are very small and can meet the limits stipulated in the Technical Guidelines for Environmental Impact Assessment-Atmospheric Environment (HJ2.2-2018) (0.01 mg/m^3 for H_2S and 0.2 mg/m^3 for NH_3).

189. **Indoor air quality** of the interior of the buildings respect to emission of VOC such as benzene and formaldehyde from decorative items and furniture in new buildings especially during the first 6 months of occupancy has been already considered during design stage. Indoor air quality will be monitored for the new building for assessing suitability for occupancy.

3. Noise

190. The noise source during the operation period of the project mainly comes from the central air conditioner, underground parking lot fan and the aerator noise of the sewage treatment station, such as various pumps and fans, and traffic noise from vehicle entering and leaving the health care facilities.

Table V-6: Noise Level and Mitigation Measures

Noise Source Name	Sound source strength (dB (A))	Mounting locations	Measures to be taken to reduce noise
Air conditioner	70–80	Underground room or roof	Low-noise products, the use of flexible joints, indoor placement, underground installation, sound insulation, muffler, vibration reduction, and distance attenuation
Ventilation	70–75	Underground garage	Low-noise products, the use of flexible joints, indoor placement, foundation damping, and duct installation muffler
Water supply Pump	80–85	Basement	Indoor placement, foundation damping, and indoor insulation
Sewage treatment station aeration	80–90	Sewage treatment room	Underground placement, foundation damping, and indoor insulation
Car driving	66.2–85	Internal road	Speed limit driving and prohibition of sirens

191. After taking these measures, the operation of project facilities will not cause significant increase of noise. The noise level at project site boundary can satisfy with the Noise Emission Standard for Industrial Enterprises Boundary (GB 22337-2008).

4. Solid Waste Management

192. The solid waste generated during the operation period of the project mainly includes general solid waste and hazardous waste. The general solid waste is mainly domestic garbage, and the hazardous waste is mainly medical waste generated during the diagnosis and treatment process and medical waste treatment station sludge at the two secondary-level hospitals. The solid waste generation is summarized in **Table V-7**. According to the Manual of the *First National Pollution Source Census of Urban Living Sources Discharge Coefficient*, the amount of medical waste generated in inpatient wards is calculated at 0.5kg / bed per day. The kitchen waste and other domestic solid waste are estimated at 0.5 kg/person respectively.

Table V-7: Solid Waste Generation of each Subproject during Operation

Subproject	Municipal Solid Waste (t/a)	Medical Waste (t/a)	Sludge (t/a)	Lab waste (t/a)
Fangchenggang	1,050	2.044	None	/
Guiyang	724.16	211.7	150	10
Yan'an	574.88	71.18	177.94	10.95

193. **Hazardous waste.** According to the National Hazardous Waste List, the lab waste, medical waste and sludge from hospital are classified as hazardous waste (HW01). The medical waste shall be managed in accordance with the Medical Waste Management Regulation (2003).

194. The medical waste shall be packed in accordance with the requirements of Standard on Packaging, Container and Warning Labels for Hospital Wastes for sorting and collection. Disinfection is carried out on the same day before packing. WBG EHS Guidelines also recommend measures on medical waste management:

(a) On-site Handling, Collection, Transport, and Storage:

(i) Seal and replace waste bags and containers when they are approximately three- quarters full. Full bags and containers should be replaced immediately.
(ii) Identify and label waste bags and containers properly prior to removal.
(iii) Transport waste to storage areas on designated trolleys/carts, which should be cleaned and disinfected regularly.
(iv) Waste storage areas should be located within the facility and sized to the quantities of waste generated, with the following design considerations:
  (a) Hard, impermeable floor with drainage, and designed for cleaning/disinfection with available water supply secured by locks with restricted access.
  (b) Designed for access and regular cleaning by authorized cleaning staff and vehicles.
  (c) Protected from sun and inaccessible to animals/rodents.
  (d) Equipped with appropriate lighting and ventilation.
  (e) Segregated from food supplies and preparation areas.
  (f) Equipped with supplies of protective clothing, and spare bags/containers.
(v) Unless refrigerated storage is possible, storage times between generation and treatment of waste should not exceed the following:
  (a) Temperate climate: 72 hours in winter, 48 hours in summer.
  (b) Warm climate: 48 hours during cool season, 24 hours during hot season.
(vi) Store mercury separately in sealed and impermeable containers in a secure location.
(vii) Store cytotoxic waste separately from other waste in a secure location. Store radioactive waste in containers to limit dispersion, and secure behind lead shields.

(b) Transport to External Facilities:

(i) Transport waste destined for off-site facilities according to the guidelines for transport of hazardous wastes/dangerous goods in the IFC General EHS Guidelines.
(ii) Transport packaging for infectious waste should include an inner, watertight layer of metal or plastic with a leak-proof seal.
(iii) Outer packaging should be of adequate strength and capacity for the specific type and volume of waste.
(iv) Packaging containers for sharps should be puncture-proof.
(v) Waste should be labeled appropriately, noting the substance class, packaging symbol (e.g., infectious waste,), waste category, mass/volume, place of origin within hospital, and final destination.
(vi) Transport vehicles should be dedicated to waste and the vehicle compartments carrying waste sealed.

195. Medical waste and lab waste temporarily stored in special storage room cannot be more than 2 days. The PIA shall entrust the local certificated medical waste disposal companies, namely Yan 'an Shengyuan Medical Waste Centralized Disposal Co., LTD, Fangchenggang Medical Waste Treatment Center and Guiyang Medical Waste Treatment Center for safe disposal. During transferring of the hazardous wastes, the provisions of the Management Methods for Transferring Hazardous Waste shall be strictly implemented, and the hazardous waste transfer joint form (triple list) shall be filled out.

196. The septic tank sludge shall be disposed by Yan 'an Shengyuan Medical Waste Centralized Disposal Co., LTD, Fangchenggang Medical Waste Treatment Center and Guiyang Medical Waste Treatment Center for safe disposal after being treated with lime and disinfected. Sludge disposal shall strictly follow the provisions of Sewage Control Standard for Medical Institutions (GB18466-2005) to ensure that no pollution is caused to the surrounding environment.

5. Occupational and Community Health and Safety

197. The risks that will affect occupational and community health and safety during operation are mainly from (i) failure of on-site medical wastewater treatment, (ii) chlorine dioxide will be used for disinfection—there is risk of chlorine dioxide leakage, (iii) risk-related to storage and usage of oxygen in the health care facilities, and (iv) exposure to infections and disease.

198. The following measures will be taken to control the risks:

(i) In the event of medical wastewater treatment operation failure, the untreated wastewater will be stored in the regulation tank temporarily; dosing disinfection agents manually in time to prevent infectious wastewater entering into the municipal sewage network.
(ii) The main equipment, such as fans, pumps, sludge valves, disinfection device shall be backed up and the power supply system should be dual-loop.
(iii) Strengthen training for the medical wastewater treatment facility operators.
(iv) Oxygen is strictly prohibited to contact with grease, fireworks, and other flammable and explosive products.
(v) The storage of oxygen must be far away from the fire source and equipped with fire-fighting facilities, and there should be fire prohibition signs outdoors.
(vi) Oxygen storage, use, transportation, and storage are strictly prohibited from collision to avoid explosion.
(vii) The equipment installation, commissioning, and maintenance of the oxygen supply

room must be carried out by trained technical personnel or a special maintenance company. Other personnel are not allowed to enter without permission.

(viii) Measures to control chlorine leakage risk include: wear self-priming filter gas masks (full cover) and rubber glove, keep away from flammable and combustible materials, the technical staff shall be trained and following the operation instructions, keep good ventilation in the workplace, avoid contact with reducing agents, and equip with leakage emergency treatment equipment.
Formulate an exposure control plan for infectious disease, provide working staff and visitors with information on infection control policies and procedures, establish standard precautions to treat all blood and other potentially infectious materials with appropriate precautions, and set up isolation room with protective equipment and good ventilation in case of epidemics.

199. **Traffic safety**. In addition, the operation of project facilities may result in an increase of traffic-related accidents and injuries to working staff, elderly people, and local communities. The incidence of road accidents could be minimized through: (i) education and awareness-raising to the working staff and elderly people, (ii) planning and segregating the people flow and vehicle flow, and (iii) and setting up speed limits in entering and exiting the project facilities.

200. **Emergency preparedness and response**. Establish preparedness plan and operation plan under emergency conditions, such as fire, flood, earthquake, wind, storm, water contamination, epidemic, air contamination, infestation, explosion, etc., to ensure a safe environment for all elderly people, faculty, staff, and visitors.

VI. INFORMATION DISCLOSURE, CONSULTATION AND PARTICIPATION

A. Legislative Framework for Public Consultation and Information Disclosure

201. Meaningful public participation and consultation in the evaluation of project planning, feasibility study, design, and implementation are an important environmental safeguards' requirement; it can directly reflect the public's perceptions on environmental quality in the project's area of influence.

202. **Asian Development Bank requirements**. ADB's SPS (2009) has specific requirements for information disclosure and public consultation. Relevant information, including those documented in environmental assessment reports, should be provided in a place, language, and form that are accessible and understandable to affected people and other stakeholders. This process shall commence early in the project cycle and continues throughout the life of the project. To make key documents widely available to the general public, ADB requires that the borrower/client submit the following documents for disclosure on ADB's website:

Category A projects:

(i) Draft EIA - at least 120 days prior to ADB Board consideration, and/or environmental assessment and review framework before project appraisal, where applicable.
(ii) Final EIA upon receipt.
(iii) Supplementary reports, if required during project implementation.
(iv) Corrective action plan/s (for major noncompliance, if any) prepared during project implementation.
(v) Environmental monitoring reports.

Category B projects:

(i) Final IEE (upon receipt or Board approval, whichever is earlier).
(ii) A new or updated IEE, if required during project implementation.
(iii) Corrective action plan/s (for major noncompliance, if any) prepared during project implementation.
(iv) Environmental monitoring reports.

203. The proposed project is classified as environmental Category B. The relevant disclosure requirements for Category B are applied.

204. The SPS (2009) requires the borrower/client carry out meaningful consultation with affected people and other concerned stakeholders, including civil society, and facilitate their informed participation. Meaningful consultation is a process that (i) begins early in the project preparation stage, and is carried out on an ongoing basis throughout the project cycle; (ii) provides timely disclosure of relevant and adequate information that is understandable and readily accessible to affected people; (iii) is undertaken in an atmosphere free of intimidation or coercion; (iv) is gender inclusive and responsive, and tailored to the needs of disadvantaged and vulnerable groups; and (v) enables the incorporation of all relevant views of affected people and other stakeholders into decision-making, such as project design, mitigation measures, the sharing of development benefits and opportunities, and implementation issues. Consultation will be carried out in a manner commensurate with the impacts on affected communities. The consultation process and its results are to be documented and reflected in the environmental assessment report.

205. **PRC requirements**. The Environmental Protection Law of the PRC (2015) requires that for project that shall compile an EIA report, the construction unit shall solicit the opinions of the public that might be affected by the project during EIA preparation. After receiving the EIA report of the project, the department in charge of examining and approving the EIA document of the construction project shall disclose the full text except for matters involving state secrets and commercial secrets. The Measures for Public Participation in Environmental Impact Assessment (2018, Ministry of Ecology and Environment) provides technical guidance on the procedures of public consultation during EIA preparation.

206. The consultation process for this project therefore shall follow both the ADB and PRC requirements.

B. Information Disclosure to Date

207. Two rounds of information disclosure for the subprojects in three project cities were conducted by the EIA institutes and implementing agencies during August 2021 to March 2022 through websites, newspapers, and community posters. The information disclosed include (i) the name and major content of the project, (ii) contact of the implementing agency, (iii) name and contact of the EIA institute, (iv) internet link of the public comment form, and (v) ways of submitting the public comment form. The second round of information disclosure was undertaken when the draft FSRs and DEIAs were available. The contacts of implementing agency and EIA institute, major findings of the IEE and DEIA, and proposed mitigation measures were disclosed to the public. The public can submit comments to the implementing agency and/or EIA institute in the process of environmental impact assessment. No comments were received as of 11 April 2022. Following figures shows the snapshot of the information disclosed in three project cities.

August 28, 2021
http://www.zgya.com/2021/08/2021082801.html

February 28, 2022
http://www.zgya.com/2022/02/2022022803.html

March 1, 2022

March 3, 2022

	
Yangjiawan village (60 m north of the subproject site, February 28, 2022)	Yangjiawan village (February 28, 2022)
	
Yan'an University (February 28, 2022) (the subproject is located)	Yan'an University (February 28, 2022)

Figure VI-1: Information Disclosure -Yan'an


防城港市文旅集团有限公司

防城港国际（东盟）传统医学合作中心项目环境影响评价第一次公示

根据《中华人民共和国环境影响评价法》、《环境影响评价公众参与办法》（生态环境部令第4号）和《关于发布<环境影响评价公众参与办法>配套文件的公告》的要求，防城港国际（东盟）传统医学合作中心项目开展环境影响评价公众参与工作，为便于了解社会公众对本项目建设环境保护方面的意见和建议，接受社会公众的监督。现将该项目的情况公示如下：

一、建设项目名称与概要

项目名称：防城港国际（东盟）传统医学合作中心项目

建设内容：本项目包含4个子项目，分别是中医健康管理中心（职业病防治中心）建设项目、防城港国际（东盟）传统医学合作中心设备购置项目、东盟公共卫生培训基地建设项目、东盟公共卫生机构能力建设项目。

（一）中医健康管理中心（职业病防治中心）主要建设内容为新建中医健康管理中心（职业病防治中心），总建筑面积17417.68m²，其中地上建筑面积14359.58m²，地下建筑面积3058.1m²，包括体检科、职业病防治研究中心、健康咨询与指导等。

（二）防城港国际（东盟）传统医学合作中心设备购置主要建设内容为购置各科室医疗设备、医疗信息化系统、智能化物资传输系统、污物管道物流系统等设施。

（三）东盟公共卫生培训基地主要建设内容为新建培训楼、学员宿舍、图书室等，总建筑面积49977.21m²，其中地上建筑面积39733.12m²，地下建筑面积10244.09m²。

（四）东盟公共卫生机构能力建设项目主要建设内容为项目组织机构能力提升；实施公共卫生及医护人员培训；国际交流培训；课题研究；居民健康培训；购置培训相关设备、检验中心、实验室相关设备。

March 8, 2022
http://www.fcgs.gov.cn/wljt/tzgg/202203/t20220309_245331.html


防城港市文旅集团有限公司

防城港国际（东盟）传统医学合作中心项目环境影响评价公众参与第二次公示

根据《中华人民共和国环境影响评价法》、《环境影响评价公众参与办法》（生态环境部令第4号）和《关于发布<环境影响评价公众参与办法>配套文件的公告》的要求，我司正对防城港国际（东盟）传统医学合作中心项目开展环境影响评价公众参与工作，为便于了解社会公众对本项目建设环境保护方面的意见和建议，接受社会公众的监督。现将该项目的情况公示如下：

一、环境影响报告书征求意见稿全文查阅方式和途径

通过网络查阅：

链接：https://pan.baidu.com/s/1jjcvP1apNSzKSbYGx3p51Q

提取码：hkmk

二、征求意见的公众范围

本项目环境影响评价范围内的公民、法人和组织，鼓励环境影响评价范围之外的公民、法人和其他组织参与。

三、公众意见表的网络链接

网络链接：

http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/201810/t20181024_665329.html

四、公众提出意见的方式和途径

公众可填写公众与意见表提出对本次环境影响评价发表自己的看法和意见，可通过电话、电子邮件、信函等方式进行反馈。为便于进一步沟通、交流和反馈，希望在发表意见时尽量提供自己的真实姓名及联系方式。

五、公众提出意见的起止时间

公示发布日起10个工作日。

六、建设单位联系方式

建设单位：防城港市文旅集团有限公司

联系地址：防城港市西湾环海大道与李子潭一级公路交汇处西南侧

联系人：张工

March 22, 2022
http://www.fcgs.gov.cn/wljt/tzgg/202203/t20220322_246684.html

廣西日報

"3·21"东航MU5735航空器飞行事故现场举行遇难者哀悼活动


廣西日報

经中央军委主席习近平批准

中央军委印发《军士暂行条例》《义务兵暂行条例》及相关配套法规

习近平在参加首都义务植树活动时强调

全社会都做生态文明建设的实践者推动者

让祖国天更蓝山更绿水更清生态环境更美好

Guangxi Daily
March 28, 2022

Guangxi Daily,
March 31, 2022

Xiwan, March 2022

Zhenyuling village, March 2022

Figure VI-2: Information Disclosure - Fangchenggang

http://www.eiabbs.net/thread-530243-1-1.html
February 1, 2022

https://www.eiacloud.com/gs/detail/3?id=20309v0gV4
March 9, 2022

International Business Daily
March 11 2022

International Business Daily
March 15 2022

Figure VI-3: Information Disclosure -Guiyang

C. Public Consultation to Date

208. Public consultations were carried out at project sites in all three project cities as part of environmental assessment. Findings are summarized in subsequent paragraphs.

209. For Guiyang subproject, total of 17 residents in Mainai village were interviewed by the EIA institute in March 2022, including 8 female and 9 male participants. The major issues the residents concerned most are: i) construction noise; ii) wastewater discharge; and iii) medical waste disposal. The wastewater shall not be discharged into Baihua Lake. The EIA institute explained that the i) wastewater will be pre-treated on-site then discharge into the municipal wastewater treatment plant; ii) the construction site will be enclosed by fence and no construction activities will be carried out in nighttime; iii) the medical waste will be collected and disposed by the Guiyang Medical Waste Treatment Center. All respondents expressed support to the project if it will not affect the environment of Baihua Lake.

Figure VI-4: Interview with residents-Guiyang

210. For Yan'an, public consultation workshop was organized by the implementing agency and EIA institute on 31 March 2022. In total 15 residents from Yangjiawa village and Yan'an University attended the workshop. The EIA institute introduced the anticipated environmental impact and proposed mitigation measures. All participants expressed supports to the project if all environmental mitigation measures can be implemented effectively. No special concerns were proposed during the workshop.

Figure VI-5: Public consultation workshop-Yan'an

211. For Fangchenggang, the access to the standard form of public comments developed by MEE was provided on the website of implementing agency during the two rounds of information disclosure in March 2022. No comments from public were received as of 11 April 2022.

D. Future Information Disclosure and Public Consultation

212. Information disclosure and public consultation relating to environment safeguards will continue throughout project implementation. The project's environmental information will be disclosed by the local EEB and ADB as follows:

(i) The project IEE will be disclosed on the project website at https://www.adb.org/.
(ii) The DEIA will be disclosed on the website of local EEBs.
(iii) All environmental monitoring reports during project implementation will be available at https://www.adb.org/.
(iv) The project information and GRM entry points will be disclosed on the information board of each construction site.

VII. GRIEVANCE REDRESS MECHANISM

213. A project-specific GRM was prepared and complies with ADB's SPS (2009) and PRC requirements. The GRM will be accessible to diverse members of the villages and community, including more vulnerable groups such as women, minority and poor. Multiple points of entry, including face-to-face meetings, written complaints, telephone conversations, or e-mail, will be available. The GRM is described in the project EMP (Appendix 1).

VIII. ENVIRONMENTAL MANAGEMENT PLAN

214. An EMP has been prepared for the project. It is an essential document to ensure the implementation of mitigation measures. The full EMP will be attached to the project administration manual (PAM) of the project.

215. The EMP defines all potential impacts of different project outputs and the mitigation and protection measures with the objective of avoiding or reducing these impacts to acceptable levels. The EMP also defines the institutional arrangements and mechanisms, the roles and responsibilities of different institutions, procedures and budgets for implementation of the EMP. The EMP draws on the findings of the project IEE, TA, and ADB review mission discussions and agreements with the relevant government agencies.

216. The EMP, presented in **Appendix 1-EMP**, defines: (i) responsibilities and authorities for the EMP implementation, (ii) summary of impacts and mitigation measures, (iii) environmental monitoring and inspection plan, (iv) institutional strengthening and training plan, (v) reporting requirements, (vi) public consultation plan, (vii) cost estimates, and (viii) mechanism for feedback and adjustment. The EMP will be included as separate annex in all bidding and contract documents. Contractors will be required to develop site-EMPs that are fully responsive to the EMP. The PMO-EO will be assigned with the responsibility to ensure contractors' compliance with the site-EMPs and the project EMP.

IX. CONCLUSION AND RECOMMENDATIONS

217. The IEE concludes that as long as the environmental mitigation and management measures, as defined in the EMP, are properly implemented, all adverse environmental impacts associated with the project will be prevented, eliminated, or minimized to an acceptable level. The project is feasible from an environment safeguards point of view. This IEE is sufficient to meet the ADB SPS requirements for the project, therefore no further assessment is required.

APPENDIX 1- Environmental Management Plan

A. Objectives

1. This project environmental management plan (EMP) is developed for the Strengthening Public Health Institutions Building Project (the project) in the People's Republic of China (PRC). The EMP is prepared in accordance with the requirements of the Asian Development Bank's (ADB's) Safeguard Policy Statement ([SPS] 2009) on the basis of the domestic environmental impact assessments (EIRs) for two subprojects / tabular environmental impact assessment (EIT) for one subproject) and feasibility study report (FSRs) prepared by the provincial implementing agencies; and the initial environment examination (IEE) conducted for the project.

2. The EMP defines appropriate mitigation measures for the anticipated environmental impacts, and defines the institutional responsibilities and mechanisms to monitor and ensure the compliance with PRC's environmental laws, standards and regulations, and ADB's SPS. The EMP specifies (i) objectives; (ii) mitigation measures; (iii) implementing organization and responsibilities; (iv) inspection, monitoring, and reporting arrangements; (v) training and institutional strengthening; (v) a feedback and adjustment mechanism; and (vi) the grievance redress mechanism (GRM).

3. The EMP will be reviewed and updated at the end of the detailed designs, as needed, in order to be consistent with the final design. The EMP (or its updated version) will be included as a separate annex in all bidding and contract documents. The contractors will prepare site-EMP based on the project EMP (Refer Annex 2 of the EMP for site-EMP template). The contractors will be made aware of their obligations to implement the EMP, and to budget the EMP implementation costs in their proposals.

4. The EMP supervision and monitoring results will be used to evaluate (i) the extent and severity of actual environmental impacts against the predicted impacts, (ii) the performance of the environmental protection measures or compliance with related rules and regulations, (iii) trends of impacts; and (iv) overall effectiveness of the mitigation measures.

B. Environmental Management Plan Implementation Arrangement

5. The project consists of three sites located in three cities: (i) Fangchenggang City, GZAR; (ii) Guiyang City, Guizhou Province; and (iii) Yan'an City, Shaanxi Province. One new health facility will be established per project site to support health security needs. The overall EMP implementation arrangements and responsibilities of governmental organizations are summarized in **Table EMP-1**.

6. **Executing and Implementing Agencies**. In Fangchenggang, the Fangchenggang Municipal People's Government will be the executing agency. The Fangchenggang Project Management Office (PMO) has been established for project management and coordination with ADB which reports to the municipal government. The project implementing agency (PIA) will be the Fangchenggang Culture and Tourism Group Co, Ltd. In Guiyang, the Guiyang Municipal People's Government will be the executing agency. The Guiyang Municipal Sanitation and Health Bureau and the Guiyang Transportation Investment Development Group Co., Ltd. will be the implementing agencies in Guiyang and will oversee the implementation of the project. A PMO has been established on behalf of the Guiyang Municipal People's Government for project management and coordination with ADB. The PMO is placed in the Guiyang Municipal Sanitation and Health Bureau. The PMO will have staff from both implementing agencies as key members.

In Yan'an, the ADB Shaanxi Provincial Project Management Center, under the provincial DRC, is the nominated executing agency and is supported by the Shaanxi Provincial ADB Project Leading Group, a project steering committee. The Yan'an University Affiliated Hospital will be the responsible implementing agency, supported by a PMO.

7. PMOs, established under each of the executing agency, will be the in charge of project coordination. PMOs will have the overall responsibility for supervising the implementation of the EMP, coordinating the project-level GRM and reporting to ADB. Each PMO will internally assign one environmental officer (PMO-EO) to supervise the effective implementation of the EMP. The PMO-EO will take charge of (i) coordinating the implementation of the EMP and developing implementation details; (ii) supervising the implementation of mitigation measures during project construction and operation; (iii) ensuring that environmental management, monitoring, and mitigation measures are incorporated into bidding documents, construction contracts, and operation management plans; (iv) submitting internal and external environmental monitoring reports to ADB; (v) coordinating the local GRM; and (vi) responding to any unforeseen adverse impact beyond those mentioned in the project IEE and the EMP.

8. Project implementing agency (PIA) from each city is responsible for day-to-day administration of the project activities. Each PIA will assign one environmental specialist (PIA-ES) to (i) review and approve contractors' site-EMPs; (ii) conduct site inspections monthly during construction; (iii) act as local entry point for the project GRM; (iv) assess the contractors' compliance with the EMP and the PRC environmental quality standards for ambient air, water, and noise quality; (v) submit quarterly inspection results to the contractors for information, and PMO and PIA for verification and confirmation.

9. **Construction contractors.** Contractors will be responsible for implementing the mitigation measures during construction under the supervision of the construction supervision firms (CSFs), PMOs, and PIAs. In their bids, contractors will be required to respond to the environmental management requirements defined in the EMP. Each contractor will be required to develop site-EMP and will assign a person responsible for environment, health, and safety. After acceptance of the constructed works, environmental management responsibilities will be handed over to the implementing agency.

10. CSFs will be selected through the PRC bidding procedure by PMOs. CSF will be responsible for supervising construction progress and quality, and implementation of the EMP on construction sites. Each CSF shall have at least one environmental engineer on each construction site to (i) conduct regular site inspection, (ii) supervise the contractor's EMP implementation performance, and (iii) prepare the contractor's environmental management performance section in monthly project progress reports submitted to PIA.

11. **Loan implementation environment consultant as a member of the project implementation support consultant (PISC) firm**. Under the PISC firm, one national loan implementation environment consultant **(**LIEC) will be recruited to support the effective implementation of the EMP. The LIEC will:

(i) assist PMOs and PIAs in conducting consultation meetings with relevant stakeholders as required, informing them of imminent construction works, updating them on the latest project development activities, GRM, contact information of PMOs, contractors, and PIAs;
(ii) assess the project components' environmental readiness prior to implementation based on the readiness indicators defined in the EMP;

(iii) update the EMP including mitigation measures, monitoring program, institutional arrangements, and training plan, as necessary, to reflect the final project scope and detailed design, and submit to ADB for review and disclosure;
(iv) support PMOs and PIAs to ensure that the bidding documents and works contracts contain provisions requiring contractors to comply with the mitigation measures in the EMP and that relevant sections of the project EMP are incorporated in the bidding and contract documents;
(v) support PMO-EOs and PIA-ESs in reviewing and approving contractors' site-EMPs and conducting periodic environmental site inspection;
(vi) assist PMOs and PIAs to establish a GRM, and provide training for PMOs and PIAs, and GRM entry points;
(vii) conduct regular EMP compliance monitoring, undertake site visits as required, identify any environment-related implementation issues, propose necessary corrective actions, and reflect these in a corrective action plan;
(viii) assist PMOs in preparing environmental sections of quarterly project progress reports to ADB;
(ix) assist PMOs in preparing semiannual internal environmental monitoring reports to ADB;
(x) provide training to PMOs, PIAs, and contractors on environmental laws, regulations, and policies (ADB's SPS), the EMP implementation, and GRM in accordance with the training plan defined in the EMP;
(xi) participate in ADB review missions, when required, and assist PMOs and PIAs in discussing environmental issues with the ADB mission members; and
(xii) conduct rapid assessments of project facilities after project completion and approximately 1 year of operation to confirm compliance with the EMP, as well as sound management practices (environment audit).

12. **External environment monitor.** PMO will appoint one independent environment monitoring consultant as an external environment monitor (EEM). The EEM will provide technical guidance and monitor the implementation and effectiveness of all the environmental safeguards activities. The EEM will

(i) review the IEE (including the EMPs and environment monitoring and inspection plans (**Table EMP-3**) and all monitoring reports prepared for the project to understand the environmental issues in the project area, and mitigation and monitoring requirements of the project;
(ii) review the EMP for the inclusion of all site-specific issues and make necessary amendments if any issues are not covered;
(iii) review the environment monitoring and inspection plan, and ensure that the location and timing of checking/testing all environmental parameters are in accordance with the site conditions;
(iv) prepare monitoring checklists for monitoring implementation of the EMP by the contractor;
(v) include test results of environment impact monitoring and advise/support the contractor in taking remedial actions if any of the test results are not within the required limits; and
(vi) review all environment reports, including quarterly environmental impact monitoring results, the semiannual internal environmental monitoring and quarterly project progress report, and prepare a concise semiannual external environmental monitoring report and submit to ADB and PMOs.

Table EMP-1: Environmental Responsibilities by Project Phase

Phase	Responsible Agencies	Environmental Responsibilities
Detailed design	Design institutes (DI)	Incorporation of environmental mitigation measures and green building design in detailed designs.
	PMOs, PIAs, and LIEC	Review the design and confirm that mitigation measures have been included in the engineering detailed design. Update the EMP before the start of construction according to the detailed design, if necessary.
	ADB	Review and approve the updated EMP, including disclosure.
Tendering and contracting	PMOs, PIAs, procurement agency, and contractors	Incorporate the EMP clauses in tender documents and contracts.
	PMOs	Engage CSFs and ensure the CSFs have dedicated and qualified staff. Engage external environmental monitor.
	LIEC and ADB	Review bidding documents; and confirm project's readiness.
Construction	Contractor	Develop site-EMP and assign EMP implementation responsibilities; ensure health and safety; and implement mitigation measures.
	PMO	Coordinate GRM; supervise EMP implementation; and prepare environmental sections of project progress report and semiannual internal environmental monitoring report (with support of the LIEC).
	PIU (CSF)	Assign one environmental specialist (PIA-ES); conduct environmental inspections; prepare quarterly environmental inspection reports; and act as local GRM entry point.
	LIEC	Advise on the mitigation measures; provide comprehensive technical support to PMO and PIA for environmental management; conduct training; conduct semiannual EMP compliance review; support PMO in preparing environmental sections of project progress reports/ internal environmental monitoring reports.
	EEM	Conduct independent monitoring of the effectiveness of the implementation of environmental mitigation measures and prepare monitoring reports.
	ADB	Conduct review missions; and review and approve environmental progress sections of the project progress reports, and internal and external environmental monitoring reports, including disclosure.
	EEB	Conduct periodic inspections of all construction projects relating to compliance with the PRC regulations and standards.
Operation	PMO	Conduct EMP compliance review, instruct PIA and implementing agencies on environmental management requirements; and prepare an annual internal environmental monitoring report for the first year of operation.
	PIA	Implementation of mitigation measures as defined in the EMP.
	EEB	Conduct periodic inspections to confirm compliance with the PRC standards and regulations.
	ADB	Review and approve environmental progress/monitoring reports and disclose on ADB project website.

ADB = Asian Development Bank, CSF = construction supervision company, EEB = ecology and environment bureau, EEM = external environmental monitor, EMP = environmental management plan, GRM = grievance redress mechanism, PMO = project management offices i.e. (i) Fangchenggang Municipal People's Government, (ii) Guiyang Municipal People's Government, and (iii) Shaanxi Provincial; PIA = project implementing agency i.e. (i) Fangchenggang City Culture and Tourism Group Co. Ltd., (ii) Guiyang City Sanitation and Health Bureau, and Guiyang Transportation Investment Development Group Co., Ltd.; and (iii) Yan'an University Affiliated Hospital (Shaanxi Province); LIEC = loan implementation environmental consultant, PRC = People's Republic of China.

C. Summary of Potential Impacts and Mitigation Measures

13. **Table EMP-2** summarizes the potential impacts and environment safeguard issues of the subprojects during pre-construction, construction, and operation as identified by the environmental impact assessments and set out in the project IEE, as well as corresponding mitigation measures designated to minimize those impacts and address these issues.

Table EMP-2: Potential Environmental Impacts and Mitigation Measures

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
Pre-construction Phase					
1. Preliminary and detailed design stage	Institutional strengthening	- PMO to appoint PMO-EO; - PIA to appoint PIA-ES; - PMO to engage PISC including LIEC.	PMO, PIA	PMO, ADB	Project readiness assessment by LIEC
	Asbestos contamination	- Conduct survey for the building to be demolished in Guiyang plot to discover and report on presence or absence of asbestos or asbestos containing material. - Where asbestos or asbestos containing material is found, engage a certified agency to safely handle and disposal of the materials in accordance with international best practices[15].	Guiyang PIA	Guiyang PMO	Asbestos survey report prepared by LDI
	Design complying with relevant applicable health, safety, and environmental codes and standards, including green building, energy-efficient building codes and specifications	- Design buildings in compliance with relevant design standards and codes for energy-efficient, safe and green public buildings, including but not limited to: GB 50011-2010 (Building Seismic Design Code); GB 50016-2014 (Code of Design on Building Fire Protection and Prevention); GB 50189-2015 (Energy Conservation Design for Public Buildings), and other applicable national design codes. Parking garages and other underground structures are permitted to be constructed below design flood elevation. - Ensure no-use of VOC-emitting materials (including paints, coatings, adhesives, carpet and furniture's) to ensure high indoor air quality. - Ensure no asbestos and asbestos	LDI	PMO, PISC	Approved detailed designs

[15] Good practice Guidance for the Management and Control of Asbestos (2022), ADB. https://www.adb.org/publications/good-practice-management-control-asbestos

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		containing materials will be used; - Satisfy the "One Star" green building criteria defined in the GB/T50378-2019 (Green Building Evaluation Standard). - The design and functional layout of health care facilities/ buildings shall comply with the GB51039-2014 (Code for Architectural Design of General Hospital) and World Bank Group's Environmental, Health and Safety Guidelines for Health Care Facilities that ensure: a) separation of clean/sterilized and dirty/contaminated materials and people flows; b) development and inclusion of adequate disinfection/sterilization procedures and facilities; c) selection of heating, ventilation and air conditioning system that provide isolation and protection from airborne infections; d) design of water systems to provide adequate supplies of potable water to reduce risks of exposure to waterborne pathogens; e) provision of hazardous material and waste storage and handling area; f) selection of easily cleaned building materials that do not support microbiological growth, are slip-resistant, nontoxic, and nonallergenic, and do not include volatile organic compound emitting pains and sealants.			
	Noise	- Ensure the indoor noise comply with GB 50118-2010 (Code for Design of Sound Insulation of Civil Buildings);	LDI	PIA, PMC	Approved detailed designs
	Vibration	- Undertake pre-construction survey of weak structures around construction sites - Ensure vibration comply with PRC standards (GB 10070-88) as well as	LDI	PIA, PMC	Approved detailed designs

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		international guidelines and standards particularly Caltrans and DIN 4,159.			
	Meaningful consultation	– Hold a public meeting prior to construction to discuss the EMP, project activities, and issues associated with the safety of nearby communities in the vicinity of the construction sites. The measures to address the public concerns will be incorporated into the updated EMP and final design if necessary.	PIA, LIEC	PMO, ADB	Approved updated EMP and final design.
	Updated EMP	– Review the mitigation measures defined in the EMP and updated to reflect the final design if necessary;	LIEC, EEM, PIA	PMO, ADB	Approved updated EMP and disclosed on ADB website
2. Construction preparation stage	Bidding documents and contractors	– Include an environmental section in the technical specifications for bidders; – Ensure that construction contracts are responsive to EMP provisions, and mitigation and monitoring measures are adequately budgeted.	LDI, PIA, LIEC	PMO, ADB	Technical specifications, bidding documents, construction contracts
	Safety measures for COVID-19	– Prior to the arrival of external project personnel (e.g., workers and consultants), the PMO will implement safety procedures and screening to ensure that all staff are tested negative for COVID-19 and do not pose a threat to local human populations. This will include: (i) requirement that all project personnel are tested negative for COVID-19, (ii) external workers and consultants confirm their COVID-19–free status to PMO prior to arrival, and (iii) project safety and sanitation measures are distributed to all personnel and are included as contractual requirements for all staff. Refer attachment 1 for Covid 19 – Health and Safety Plan.	PMO, PIA, LIEC	ADB	Approve Covid 19 – Health and Safety Plan
	GRM	– Establish a GRM, appoint a GRM coordinator;	PMO, PIA, LIEC	ADB	Operational GRM

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		- Brief and provide training to GRM entry points; - Disclose GRM to affected people before construction begins.			
	Capacity building	- Provide trainings to PMO, PIA, and contractors on implementation and supervision of EMP, GRM, and reporting in compliance with the training plan (Table EMP-6).	LIEC, PIA	PMO	Evidence of training provided, satisfaction survey of participants
	Site-EMPs	- Develop Site-EMPs, responding to all clauses and requirements of this EMP; - Develop construction waste disposal plan as required by the local Municipality Regulation on Construction Waste Management.	Contractors, CSF, LIEC	PMO, PIA, local urban management authority	Approved Site-EMPs and construction waste management plan
Construction Phase					
Soil	Soil erosion	- Prepare soil erosion control plan (showing how runoff will be controlled at site perimeter to control soil and water runoff, and how disturbed areas will be reclaimed); - Minimize active open excavation areas; - Construct intercepting ditches and drains to prevent runoff entering construction sites, and divert runoff from sites to existing drainage; - Stabilize all earthwork disturbance areas within maximum 14 days after earthworks have ceased; - Properly slop and re-vegetate disturbed surface.	Contractor	PIA, CSF, LIEC	Inspection reports of PIA-ES
	Soil contamination	- Store chemicals/hazardous products and waste on impermeable surfaces in secure, covered areas; - Remove all construction wastes from the site to approved waste disposal sites; - Provide spill cleanup measures and equipment at each construction site;	Contractor	PIA, CSF, LIEC	Inspection reports of PIA-ES

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		- Conduct training in emergency spill response procedures.			
	Spoil disposal	- Reuse the spoil as possible following the regulation of local Urban Administration Bureau. - Prepare and implement measures as per spoil management plan for safe disposal of the construction spoil. - The surplus spoil can only be disposed at the site approved by the local Urban Administration Bureau.	Contractor	PIA, CSF, LIEC, Urban Administration Bureau	Inspection reports of PIA-ES
Surface and Groundwater	Pollution of surface and groundwater resources	- Install water collection basins and sediment traps in all areas where construction equipment is washed; - Wastewater generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled; - Surplus wastewater and wastewater generated from building construction activities, including concreting, plastering, cleaning of works and similar activities should be discharged into sewer after removal of solids in a silt removal facility; - Sewage from temporary toilets, kitchens, and similar facilities should be stored in an on-site facility (such as septic tank), emptied regularly, and transported to a designated wastewater treatment plant for further treatment.	Contractor	PIA, CSF, LIEC	Inspection reports of PIA-ES
Solid waste	Construction and domestic wastes generated on construction sites	- The transportation and disposal of construction solid waste shall comply with provisions of the local Municipality Regulation on Construction Waste Management to approved sites; - Maximize reuse/recycling of construction and deconstruction wastes (e.g., iron, bricks, windows, doors, steel bars, etc.);	Contractor	PIA, CSF, LIEC	Inspection reports of PIA-ES

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		- Provide appropriate waste storage containers for workers' municipal garbage and hazardous wastes; - Install confined storage points of solid wastes away from sensitive receptors, regularly haul to an approved disposal site; - Use licensed contractors to remove wastes from the construction sites; - Prohibit burning of waste.			
Noise	Noise from construction activities	- Maintain equipment and machinery in good working order; undertake regular equipment maintenance, ensure compliance with PRC standard of GB12523-2011; - Operate between 07:00H-20:00H only and reach an agreement with implementing agencies management and nearby residents regarding the timing of heavy machinery work, to avoid any unnecessary disturbances; nighttime works (22:00 to 6:00) should only be conducted in exceptional cases, and a permit should be obtained for that purpose; - Inform potentially affected people including students, staff and nearby residents in advance; - Install temporary anti-noise barriers to shield school buildings where noncompliance with Category 2 in Environmental Quality Standards for Noise (GB3096-2008) and World Bank Group's EHS noise standard (daytime 55 dB and night time 45 dB) is anticipated/monitored; - For training buildings within 100 meters, construction peak season shall be arranged during the institute holidays to reduce the noise impact. - Locate sites for concrete-mixing and similar	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		activities at least 300 meters from sensitive areas if without any mitigations; - Monitor/observe noise within construction sites and at nearby sensitive areas at regular intervals (as defined in the monitoring plan); - Seek suggestions from potentially affected sensitive receptors to reduce noise annoyance. - Disseminate information on procedure of handling complaints through the GRM.			
Vibration	Risk to nearby structures	- Undertake pre-construction survey of weak structures around construction sites. - Install vibration monitoring devise. - Ensure vibration comply with PRC standards (GB 10070-88) as well as international guidelines and standards particularly Caltrans and DIN 4,159. - Establish good communication between the contractor and local residents.	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES
Ambient Air	Dust generated during construction	- Dust -prone materials such as residual soil and sand at the construction site shall be covered with dust-proof nets (cloths) and sprayed. Cement and other fine materials shall be stored in the warehouse or fully covered. The loading height of residual soil, sand and construction waste shall not exceed the guardrail of the vehicle. - Install perimeter fences at each site prior to construction. The fence shall be at least 2m high; - Spray water at least twice a day where fugitive dust is generated; - Cover trucks carrying earth, sand or stone with tarps or other suitable covers to avoid spilling and dust generation; - Undertake regular air quality monitoring in	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		around the construction site in accordance with the monitoring plan; - Regularly consult the nearby residents to identify concerns and implement additional dust control measures as necessary.			
	Air emissions from construction vehicles and machinery	- Store petroleum or other harmful materials in appropriate places and covering to minimize fugitive dust and emission; - Maintain vehicles and construction machinery in good condition.	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES
Physical cultural resources	Damage to known or unknown above or below-ground cultural relics	- Establish chance-find procedures for physical cultural resources; - If a new site is unearthed, work must be stopped immediately and the implementing agencies and local cultural relic bureau promptly notified, and construction will resume only after a thorough investigation and with the permission of the appropriate authority.	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES
Flora and Fauna	Protection of vegetation, re-vegetation of disturbed areas; greening of sites	- Preserve existing vegetation where no construction activity is planned; - Remove trees or shrubs only as a last resort if they impinge directly on permanent structures and replant to appropriate places if possible; - No plant species will be used that are classified in the PRC as weeds, as defined by the China National Invasive Plant Database (www.iplant.cn/ias); 229 species) and by the MEE and Chinese Academy of Sciences (19 species). - The area of afforestation shall not be less than the area of forest vegetation reduced due to the occupation of forest land (Fangchenggang subproject). - Properly re-vegetate disturbed areas after completion of works;	Contractor, PIA	PIA, CSF, LIEC	Inspection reports of PIA - ES

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
Health and Safety	Occupational health and safety	– Appoint one staff to implement and supervise the implementation of the Site-EMP and the performance of subcontractors; – Provide safe supply of clean water and an adequate number of latrines and other sanitary arrangements at the site and work areas, and ensure that they are cleaned and maintained in a hygienic state; – The conditions of the construction camp shall meet with the requirements of Construction Site Environment and Hygiene Standards (JGJ 146-2013) and Workers' Accommodation: Processes and Standards of World Bank Group16. – Provide garbage receptacles at construction sites; – Provide personal protective equipment for workers in accordance with relevant health and safety regulations; – Develop an emergency response plan to take actions on accidents and emergencies; document and report occupational accidents, diseases, and incidents; organize a fully equipped first-aid base at each construction site; – Establish Records Management System that will store and maintain easily retrievable records on occupational accidents, diseases, and incidents. – Train all construction workers in basic sanitation and hygiene issues, general health in basic sanitation and hygiene issues, general health and safety matters, and on the specific hazards of their work; – Posters drawing attention on-site safety,	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES

[16] Workers' Accommodation: Processes and Standards (ifc.org)

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		rescue, and industrial health regulations shall be made or obtained from the appropriate sources and will be displayed prominently in relevant areas of the site. – COVID-19 health and safety plan. The project EMP includes a COVID-19 health and safety plan (EMP Attachment 1) to address COVID-19 health risks. The plan will be prepared in line with government regulations and guidelines on COVID-19 prevention and control, and in consultation with public health agencies in the area. The plan will include (i) measures to record the locations that workers have visited/lived immediately before and during project work; (ii) schedules for disinfecting/cleaning offices, yards, stores and labor camps; (iii) measures to implement temperature checks and other health checks on-site; (iii) physical distancing measures, particularly in worker camps; (iv) requirements for mandatory use of personal protective equipment such as facemasks, and provision of handwashing stations, hand sanitizers, and other appropriate protective measures; (v) how workers and residents living near project sites will be provided with information to protect themselves from COVID-19; (vi) procedures to be adopted in the event a worker is suspected of having contracted COVID-19; and (vii) other COVID-19 prevention and control measures appropriate for the local context.			
	Community Health and Safety	– Prepare traffic control plan within and around the proposed sites during construction, to be approved by implementing agencies' management, and local traffic management administration	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		before startup of construction. The plan shall include provisions for diverting or scheduling construction traffic to avoid peak traffic hours, main teaching activities, such as exams [17], regulating traffic at road crossings with an emphasis on ensuring public safety through clear signage; - Designate staff members to control traffic during on-school and off-school hours; - Ensure that all sites are secure, discouraging access through appropriate fencing; place clear signs at construction sites in view of the people at risk (including students, staff and nearby communities), warning people of potential dangers such as moving vehicles, hazardous materials, excavations, etc. and raising awareness on safety issues; - Return machinery to its overnight storage area/position; - In collaboration with the PIA, hold a meeting prior to commencing construction to discuss issues associated with ensuring the safety of students and staff, as well as nearby communities in the vicinity of the construction site.			
	Interruption to utilities' provision	- Assess potential disruption to services and identify risks before starting construction; - If temporary disruption is unavoidable, develop a plan to minimize the disruption and communicate the dates and duration in advance to all affected people, in conjunction with the institute/school management.	Contractor	PIA, CSF, LIEC	Inspection reports of PIA - ES
Operation Phase					

[17] Following the traffic regulation plan developed by the local traffic management bureau during major examinations, such as the high school entrance examination and the college entrance examination.

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
Noise	Prevention of noise from air conditioner, fans	- Select low noise equipment; use flexible joints; indoor placement; underground installation; installation of mufflers; foundation damping.	Facility Operator	Local EEB	Number of complaints
	Noise from vehicles entering and leaving the health care facilities	- Speed limit driving; - Prohibition of sirens.	Facility Operator	Local EEB	Number of complaints
Air	Canteen fume	- Install and operate the fume purification system with purification efficiency greater than 85%.	Facility Operator	Local EEB	Number of complaints
	Exhaust gas from underground garage	- Maintain good ventilation. The air exchange frequency is more than 6 times/h through special exhaust vent.	Facility Operator	Local EEB	Number of complaints
	Odor from on-site medical wastewater treatment station	- cover the regulation tank and aeration tank of the sewage treatment stations	Facility Operator	Local EEB	Number of complaints
Wastewater	Improper sewage management from health facilities	- Ensure the connection of new buildings to on-site pretreatment facilities (septic tanks) and municipal sewage collection and treatment system; - Periodically monitor (visual inspection) on sludge accumulation in septic tanks and request licensed companies to de-sludge as needed. - Establish routine maintenance program and provide regular on-job training to the workers.	Facility Operator	Local EEB	No evidence of illicit wastewater discharge on-site during site inspection
	Improper sewage management for on-site medical wastewater treatment stations	- Provision of dual power supply; - Ensure equipment in good working order; - Spare parts for key components; - Provide operational training to technical staff; - Establish routine maintenance program and provide regular on-job training to the workers.	Facility Operator	Local EEB	No evidence of illicit wastewater discharge on-site during site inspection
Solid waste	Inappropriate	- Provide adequate solid waste collection	Facility	Local sanitation	No evidence of

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
	management of non-hazardous solid waste	facilities in all buildings; - Provision of separate collection bins for paper, biodegradable wastes, metallic waste, and other waste; - Regularly clean and disinfect waste collection facilities.	operator	department	illicit waste dumping during site inspection
	Inappropriate management of hazardous wastes (lab waste, medical waste and sludge from medical wastewater treatment stations)	- Medical waste shall be managed in accordance with the Medical Waste Management Regulation. - The medical waste shall be packed in accordance with the requirements of Standard on Packaging, Container and Warning Labels for Hospital Wastes for sorting and collection. Disinfection is carried out on the same day before packing. - Medical waste temporarily stored in special storage room cannot be more than 2 days. - Entrust certificated agency to carry out the collection and disposal work. During transferring of the hazardous wastes, the provisions of the Management Methods for Transferring Hazardous Waste shall be strictly implemented, and the hazardous waste transfer joint form (triple list) shall be filled out. - The septic tank sludge will be pre-treated with lime and disinfected before final disposal. Sludge disposal shall strictly follow the provisions of Sewage Control Standard for Medical Institutions (GB18466-2005) to ensure that no pollution is caused to the surrounding environment. - The hazardous waste, including medical waste, medical sludge, will be handled by Yan 'an Shengyuan Medical Waste Centralized Disposal Co., LTD, Fangchenggang Medical Waste Treatment Center and Guiyang Medical Waste	Facility operator	Local sanitation department and hazardous waste management authority	No evidence of illicit waste dumping during site inspection

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		Treatment Center.			
Health and Safety	Health safety of the people and working staff (for all health care facilities)	– Ensure compliance with relevant health and safety regulations on ventilation, indoor air quality, lighting, noise, fire escape, etc.; – Establish preparedness plan and operation plan under emergency conditions, such as fire, flood, earthquake, wind, storm, water contamination, epidemic, air contamination, infestation, explosion, etc. to ensure a safe environment for all elderly people, faculty, staff, and visitors.	Facility Operator	Local disease control authority and emergency response department	Number of incidents and complaints
	Risk to community health caused by failure of medical wastewater treatment	– In the event of medical wastewater treatment operation failure, the untreated wastewater will be stored in the regulation tank temporarily; dosing disinfection agents manually in time to prevent infectious wastewater entering into the municipal sewage network. – The main equipment, such as fans, pumps, sludge valves, disinfection device shall be backed up and the power supply system should be dual-loop. – Provisions of training to the medical wastewater treatment facility operation staff;	Facility Operator	Local disease control authority and emergency response department	Number of incidents and complaints
	Risk-related to chlorine dioxide leakage	– wear self-priming filter gas masks (full cover) and rubber glove; – keep away from flammable and combustible materials; the technical staff shall be trained and following the operation instructions; – keep good ventilation in the workplace; avoid contact with reducing agents; equipped with leakage emergency treatment equipment.	Facility Operator	Local disease control authority and emergency response department	Number of incidents and complaints
	Risks related to oxygen storage and usage	– Oxygen is strictly prohibited to contact with grease, fireworks and other flammable and explosive products;	Facility Operator	Local disease control authority and emergency	Number of incidents and complaints

Item/Media	Potential Impacts and Issues	Mitigation Measures	Implementing Agency	Supervising Agency	Monitor Indicators
		– The storage of oxygen must be far away from the fire source and equipped with fire-fighting facilities, and there should be fire prohibition signs outdoors; – Oxygen storage, use, transportation, and storage are strictly prohibited from collision to avoid explosion; – The equipment installation, commissioning and maintenance of the oxygen supply room must be carried out by trained technical personnel or a special maintenance company. Other personnel are not allowed to enter without permission.		response department	
	Exposure to infections and diseases	– Formulate an exposure control plan for infectious disease; – provide working staff, elderly people and visitors with information on infection control policies and procedures; – Set up isolation room in the case of epidemic, with protective equipment (protective clothing, medical masks, gloves, etc.) in a relatively independent, well ventilated single room, with separate toilets. – establish standard precautions to treat all blood and other potentially infectious materials with appropriate precautions.	Facility operator	Local disease control authority	Number of incidents and complaints
	Traffic safety (all project facilities)	– Separate the people flow and vehicle flow; – Education and awareness-raising on traffic safety to the working staff and common people; – Speed limits entering exiting the project facilities.	Facility operator	Local traffic management authority	Number of incidents and complaints

ADB = Asian Development Bank, CSF = construction supervision firm, EEB = ecology and environment bureau, EEM = external environmental monitor, EMP = environmental management plan, GRM = grievance redress mechanism, IA = implementing agency, LDI = local design institute, LIEC = loan implementation environmental consultant, PIA = project implementing agency, PMO = project management office.

D. Environmental Inspection and Monitoring

14. Environment safeguards monitoring will include (i) project readiness monitoring, to be conducted by the LIEC who is included in the team of the project implementation support consultant firm, engaged under the project; (ii) environmental impact monitoring, to be conducted by a licensed environment monitoring station; (iii) internal environmental monitoring conducted by PMO with assistance of the LIEC, and (iv) external environmental monitoring during project implementation and the first year of project operation, to be conducted by an EEM. Monitoring and reporting arrangements defined for this project are described below.

15. **Assessment of project readiness.** Before construction, the LIEC will assess the project's readiness in terms of environmental management based on a set of indicators (**Table EMP-3**) and report it to ADB and PMO. This assessment will demonstrate that environmental commitments are being carried out and environmental management system (**Table EMP-3**) are in place before construction starts, or suggest corrective actions if the project readiness indicators cannot satisfy.

Table EMP-3: Project Readiness Assessment Indicators

Indicator	Criteria	Assessment
EMP update	The EMP updated after detailed design, and approved by ADB	Yes No
Environmental supervision in place	LIEC is in place and has trained environment consultants	Yes No
	Qualified external environmental monitor contracted by PMO	Yes No
	Environment officer assigned by PMO (PMO-EO)	Yes No
Compliance with loan covenants and assurances	The borrower complies with loan covenants related to project design and environmental management planning	Yes No
Public involvement effectiveness	Meaningful consultation completed; construction activities publicized at construction sites	Yes No
	GRM established with entry points publicized	Yes No
Chinese version EMP distributed to all parties	EMP translated and distributed by PMO	Yes No
Contracts with environmental safeguards	Bidding documents and contracts incorporating the environmental activities and safeguards listed as loan assurances	Yes No
Site construction planning (environmental)	Site-EMP prepared for each work site by the contractors and cleared by the implementing agencies	Yes No
EMP financial support	EMP budget established, and required funds set aside for EMP implementation by each implementing agency	Yes No

ADB = Asian Development Bank, EMP = environmental management plan, PMO = project management office, GRM = grievance redress mechanism, LIEC = loan implementation environmental consultant.

16. **Environmental impact monitoring by monitoring station**. Each implementing agencies will contract a local licensed environmental monitoring station to conduct environmental impact monitoring in accordance with the monitoring plan (**Table EMP-4**). Monitoring will be conducted during construction and operation period, until a project completion report is issued. Quarterly monitoring results will be prepared by the environmental monitoring station and submitted to PIA and PMO.

17. **Internal Environmental monitoring and reporting.** The LIEC will review project progress and compliance with the EMP based on field visits, and the review of the environmental impact monitoring conducted by the environmental monitoring station. The findings of the LIEC will be reported to ADB through the semiannual internal environmental monitoring report and quarterly project progress reports. The reports will include (i) progress made in the EMP implementation; (ii) overall effectiveness of the EMP implementation (including public and occupational health and safety); (iii) environmental impact monitoring and compliance with allowable emission limits; (iv) institutional strengthening and training; (v) public consultation (including GRM); and (vi) any problem encountered during construction and operation, and the relevant corrective actions undertaken. The LIEC will help PMO prepare the reports and submit the English report to ADB for appraisal and disclosure.

18. An EEM will be engaged by PMO to conduct independent verification of the project's compliance with the EMP and the relevant PRC regulations and standards. The EEM will review all environment reports, including quarterly environmental impact monitoring results, the semiannual internal environmental monitoring and quarterly project progress report and prepare a semiannual external environmental monitoring report and submit to ADB and PMO. The report should confirm the project's compliance with the EMP and the PRC legislation standards, identify any environment-related implementation issues, and recommend corrective actions.

Table EMP-4: Environmental Monitoring and Inspection Plan

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency and Duration	Implementing Entity	Supervising Entity
Construction Stage					
Dust and noise	TSP, LAeq	At four boundaries of all construction sites	Quarterly	EMS	PIA LIEC EEM
	TSP, PM_{10}, LAeq	At entrance of the construction site	Continuous online monitoring	Contractor	PIA LIEC EEM
Construction wastewater	SS, petroleum	Outlet of temporarily sedimentation tank	Quarterly	EMS	PIA LIEC EEM
Soil runoff and contamination	(i) adequacy of soil runoff prevention measures; (ii) adequacy of soil contamination prevention techniques.	Visual inspection of the construction sites.	Weekly during peak construction period, and monthly after	Contractor CSF	PIA LIEC EEM
Solid and liquid waste management	(i) adequacy of solid and liquid waste management, storage and containment system; (ii)	Visual inspection of the construction sites.	Weekly during peak construction period, and monthly after.	Contractor CSF	PIA LIEC EEM

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency and Duration	Implementing Entity	Supervising Entity
	presence of solid waste dumps, waste fires.				
Construction site health and safety	Site inspection of occupational health safety checklist in site-EMP	Visual inspection and interviews with construction workers and contractors at construction sites	Weekly during peak construction period, and monthly after.	Contractor CSF	PIA LIEC EEM
Community health and safety	(i) adequacy of construction site signage and fencing; (ii) adequacy of temporary noise mitigation measures; (iii) accidents involving public and workers; (iv) emergencies and responses; (v) public complaints about noise, air pollution, construction site safety, localized flooding, etc.	Visual inspection of the construction sites informal interviews with nearby residents	Weekly during peak construction period, and monthly after.	Contractor CSF	PIA LIEC EEM
Operation Phase					
Wastewater	pH, color, SS, CODcr, BOD5, NH3-N, TP, TN; number of fecal coliforms, residual chlorine	Outlet of sewage treatment facilities (all facilities)	Quarterly Yearly	EMS	EEB EEM LIEC
	CODcr, NH_3-N	Outlet of medical wastewater treatment station	Real-time	Facility operator	EEB EEM LIEC
Exhaust gas	NH_3, H_2S	At the medical wastewater treatment station and four	Semiannual	EMS	EEB EEM LIEC

Item	Monitoring Parameter	Monitoring Location	Monitoring Frequency and Duration	Implementing Entity	Supervising Entity
		boundaries of the plot			
Indoor air quality	Temperature, relative humidity, air flow speed, new wind volume, SO_2, NO_2, CO, CO_2, Ammonia (NH_3), O_3, Formaldehyde (HCHO) Benzene (C_6H_6) Methylbenzene (C_7H_8) Dimthylbenzene(C_8H_{10}) (=xylol) Benzo[a]pyrene [B(a)P] ($C_{20}H_{12}$) Respirable suspended particulate (PM_{10}) Total volatile organic compound (TVOC) Total bacterial colony count Radon (^{222}Rn)	Randomly select one room at each floor; the number of monitoring points is determined by the room area: <50 m^2: 1-3 points; 50-100 m^2: 3-5 points; >100 m^2: at least 5 points.	Once before the use	EMS	EEB EEM LIEC
Noise	L_{Aeq}	Four boundaries at each plot;	Quarterly	EMS	EEB EEM LIEC
Incidents record	Occupational and Community health and safety incidents during operation to be recorded with respect minor incident, fatal accident etc.	All facilities	Ongoing, record once incidents occur	Facility operator	Local disease control and safety authority EEM LIEC
Training record	Training conducted in accordance with the Table EMP-6.	All facilities	Ongoing	Facility operator	EEM LIEC

CSF = construction supervision firm, EEB = ecology and environment bureau, EMP = environmental management plan, EEM = external environmental monitor, EMS = environmental monitoring station, PMO = project management office, LIEC = loan implementation environmental consultant, SS = suspended solids.

E. Environmental Reporting

19. The executing agencies will provide ADB with project quarterly progress reports in a format

consistent with ADB's project performance reporting system, including (i) progress achieved by output as measured through the indicators' performance targets, (ii) key implementation issues and solutions, (iii) updated procurement plan, and (iv) updated implementation plan for the next 6 months; and (v) a project completion report within 6 months of physical completion of the project.

20. The environmental section of quarterly project progress reports and semiannual internal environmental monitoring reports will present the EMP implementation status, results of inspections conducted by PIA-ES, problems encountered during construction and operation, if any, and the relevant corrective actions undertaken. The semiannual environment monitoring report will be compiled by the LIEC, on behalf of PMO, and be disclosed on ADB website. The effectiveness of the EMP implementation and public satisfaction to the solutions of environmental concerns and complaints will also be assessed in the project completion report.

21. The EEM will report on a semiannual basis to ADB to verify if sound environmental management practices were followed during implementation. In case the implementation of EMP measures is not satisfactory, the EEM will recommend actions to enhance environmental compliance. The external environmental monitoring report will be submitted to ADB through PMO 30 days after the first internal environment monitoring reports of the half year are submitted to ADB by the PMO, and as needed, when compliance/grievance issues occur. The external environmental monitoring report will be disclosed on the ADB website.

22. **Table EMP-5** summarizes the reporting requirements.

Table EMP-5: Reporting Requirements

Reports	Purpose	From	To	Frequency	Disclosure requirements
Site inspection and monitoring results	Confirmation of contractors' compliance with EMP, presentation of monitoring results	Contractor, CSF	PIA	Quarterly	N/A
Project progress reports (including environmental section)	General project progress, including a summary of EMP implementation	PMO	ADB	Quarterly	N/A
internal Environment monitoring reports	Adherence of environmental covenants and EMP, presentation of internal monitoring results	PMO, LIEC	ADB	Semi-annually (30 days of the end of reporting period) during construction and annually until project completion report	ADB website
External environment monitoring report	Confirmation of project's compliance with the EMP and verification of internal environmental monitoring reports	PMO	ADB	Semi-annually (30 days after the submission of internal environment monitoring reports)	ADB website

ADB = Asian Development Bank, CSF = construction supervision firm, EMP = environmental management plan, PMO = project management office, LIEC = loan implementation environment consultant, N/A = not applicable, PIA = project implementing agency.

F. Institutional Strengthening and Training

23. The capacity of the staff of PMOs and PIAs responsible for the EMP implementation and supervision will be strengthened. The project will address any lack of capacities and expertise in environmental management through (i) institutional strengthening, and (ii) training.

24. **Institutional strengthening.** The capacities of PMOs and PIAs to coordinate environmental management will be strengthened through the following measures:

(i) The appointment of a staff member within PMOs (PMO-EO) in charge of the EMP coordination, including GRM.
(ii) The appointment of one national environmental consultant under the loan implementation consultancy (the LIEC) to guide PMOs and PIAs in implementing the EMP and ensuring compliance with ADB SPS.
(iii) PIAs to conduct regular site inspections and coordinate local environment monitoring agencies periodic reports.

25. **Training**. The executing agencies, PMOs, the PIAs, and contractors will receive training in the EMP implementation, supervision, and reporting, and on the GRM. (**Table EMP-6**). Training will be facilitated by the LIEC, with the support of other experts under the loan implementation consultant services. A budgetary provision of $15,000 has been made for the same.

Table EMP-6: Training Program - Summary of Training Needs

Training Topic	Summary of Training Purpose and Content	Recipients/ Participants	Frequency or Target Date
Induction to EMP	Overview of EMP, including site information, pollution risks and controls, and programs; and preparation of site-EMPs and training on implementation to staff of contractor(s)	PMOs, PIAs, contractor, and CSF	At beginning of project
Review of EMP, and refreshers' training on EMP	EMP monitoring, supervision, reporting, procedures, and review of EMP, including new changes and updates	PMOs, PIAs, contractor, and CSF	1 year after project start or more frequently if required
GRM	GRM roles and responsibilities, and procedures	PMOs, PIAs, contractor, CSF, and other stakeholders	Once prior, and once the first year of project operation
Environmental aspects of facilities operation	Sludge treatment and disposal process; occupational and community health and safety; and storage, transportation, and disposal of medical waste. (A series of training modules on good practices in health care waste management of WHO can be referred).[a]	PIAs, and facility operators	Once at first year of operation, and yearly after
Emergency preparedness and response drill	Organize drill on emergency conditions such as fire, natural disaster, epidemic, explosion, etc.	PIAs, and facility operators	Once at first year of operation, and yearly after

CSF = construction supervision firm, EMP = environmental management plan, PMO = project management office, GRM = grievance redress mechanism, WHO = World Health Organization, PIA = project implementing agency.
[a] https://www.who.int/water_sanitation_health/facilities/waste/training_modules_waste_management/en/

G. Consultation, Participation, and Information Disclosure

26. Information disclosure and public consultation relating to environment safeguards will continue throughout project implementation. The project's environmental information will be disclosed by the local EEB and ADB as follows:

(i) The project IEE will be disclosed on the project website at https://www.adb.org/.
(ii) The environmental impact assessments and tabular environmental impact assessment (in Chinese) will be disclosed on the websites of provincial EEB.
(iii) All environmental monitoring reports during project implementation will be available at https://www.adb.org/.
(iv) The project information and GRM entry points will be disclosed on the information board of each construction site (in Chinese).

27. An indicative consultation plan has been developed (Table EMP-7) to instruct PMOs to organize meaningful consultation throughout project implementation. The cost for these consultations will be borne by PMOs under project monitoring cost.

Table EMP-7: Public Consultation Plan

Organizer	Format	No. of Times	Subject	Attendees
Pre-construction phase				
PMOs and PIAs	Public consultation workshop and site visit	Once before construction commences	Introduce the project activities, proposed mitigation measures, entry points of the GRM	Residents adjacent to subproject sites
Construction phase				
PMOs and PIAs	Public consultation workshop and site visit	Once each year during construction	Adjusting of mitigation measures if necessary; construction impact; and comment and suggestion	Residents adjacent to subproject sites
Operation stage				
PMOs and PIAs	Public consultation workshop and site visit	Once in the first year	Effectiveness of mitigation measures, impacts of operation, comments and suggestions	Residents adjacent to subproject sites

GRM = grievance redress mechanism, PMO = project management office, PIA = project implementing agency.

28. PMOs shall announce the time, place, theme, and registration method of the meeting to the public through the website and post announcements in places where the public can easily be informed 2 weeks prior to the meeting. PMOs shall disclose the minutes and measures to address the public concerns truthfully to the public through the website, WeChat group, community posters, etc., within 5 working days after the consultation forum.

H. Environmental Management Plan Cost Estimates

29. The budget for implementing EMP measures in this project is $7.717 million. The details of estimated EMP costs are specified in **Table EMP-8**.

30. The costs of building and maintaining infrastructure systems included in the infrastructure construction and operating costs, and therefore, are not to be double counted as part of the EMP costs. Those that are temporary measures particularly during the construction stage, such as dust suppression, use of quiet/low-noise powered mechanical equipment, etc., will need to be included in the tender documents, otherwise they are not budgeted by the contractor, and they will not be

done. The cost for implementing these measures is included in the EMP.

Table EMP-8: Cost Estimates for EMP Implementation and EMS Capacity Building

Item	**Unit cost** ($)	**Total** ($ million)	**Source of Funds**
Environmental protection during construction works (calculated based on the floor area and cost of civil works): - Erosion control - Dust and noise control - Waste management - Site safety, traffic management	Fangchenggang	3.82	Works contractors
	Guiyang	0.83	
	Yan'an	2.80	
EMP and GRM training	Lump sum	0.015	PMO through PISC firm package
LIEC: national 12 person-months, including consultant fees, travel costs)	10,000/month	0.12	PMO through PISC firm package
External environmental monitor	/	0.042	Implementing Agency counterpart fund
EMS for environmental impact monitoring	/	0.090	Implementing Agency counterpart fund
Total ($ million)		**7.717**	

EMP = environmental management plan, EMS = environmental monitoring station, GRM = grievance redress mechanism, LIEC = loan implementation environment consultant, PISC = project implementation support consultant.

I. Grievance Redress Mechanism

31. Each PMO will establish a separate GRM for environmental related grievances. GRM will be defined in compliance with ADB's SPS requirement to prevent and address environmental and social safeguard issuesPublic grievances addressed by the GRM will most likely be limited to environmental issues during the construction phase. Grievances will most likely relate to dust emissions, construction noise, disposal of waste materials in inappropriate places, and inadequate construction site safety.

32. In consultation with PMO and the PIA, where construction activities are planned, it was agreed that a Public Complaint Center (PCC) will be established within PMO. The PCC will instruct contractors, implementing agencies, and the implementing agency if people complain about the project. The PCC will coordinate with the local government and environmental protection bureau, as necessary, and will be supported by the LIEC and external environment monitor.

33. The contact persons for different GRM entry points (contractors, the implementing agency, and PCC) will be identified prior to construction. The contact details for each entry point (including phone numbers, -mail addresses, and postal addresses) will be disclosed on information boards at all construction sites.

34. Eligible complaints include those where (i) the complaint pertains to the project, and (ii) the issues arising in the complaint fall within the scope of environmental issues that the GRM is authorized to address. Ineligible complaints include those where (i) the complaint is clearly not project-related, and (ii) the nature of the issue is outside the mandate of the environment GRM (such as issues related to allegations of fraud or corruption). Complaints ineligible to the GRM will be recorded and passed onto relevant authority. Meanwhile, the complainant will be informed of the decision and the reasons for rejection.

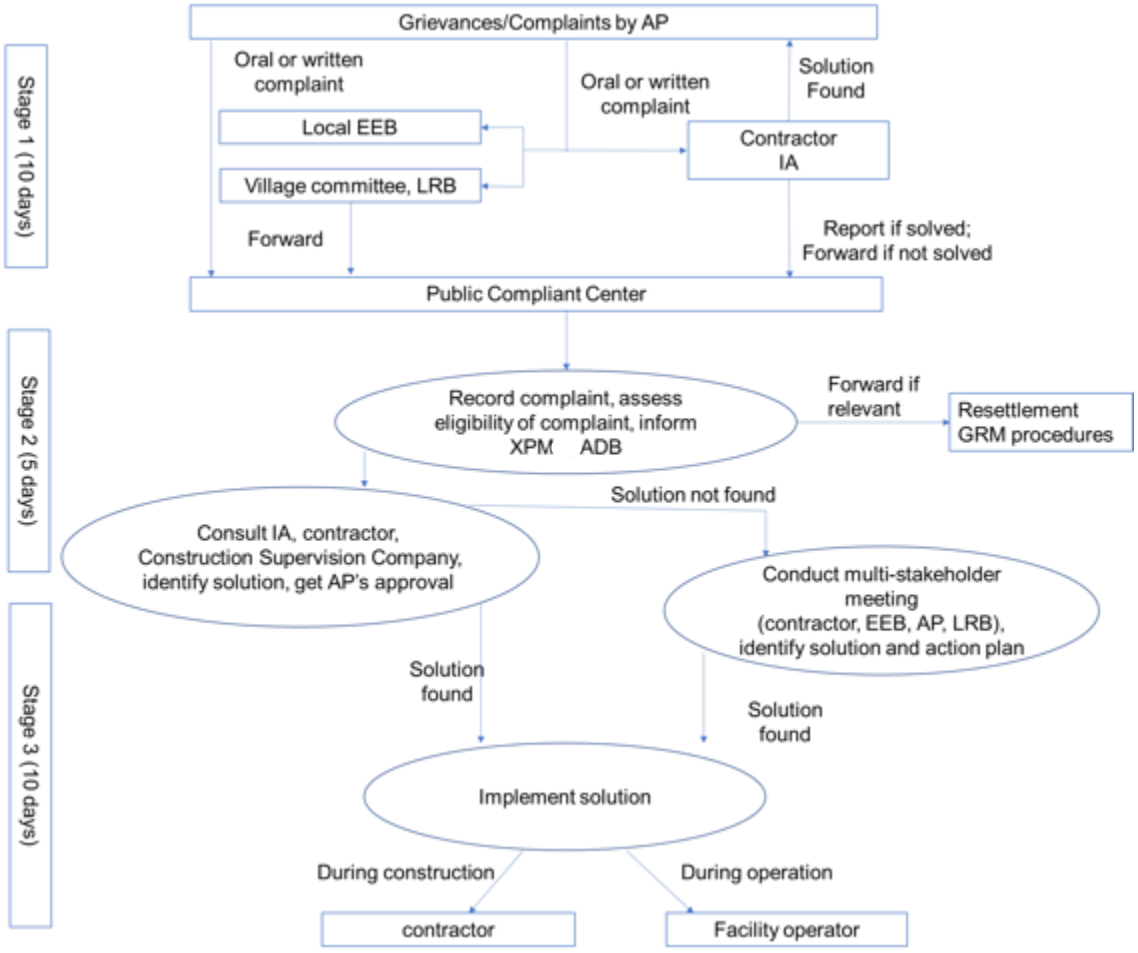
35. **Grievance redress mechanism procedure and timeframe.** Procedures and timeframes for the grievance redress process are as follows:

(i) **Stage 1** (maximum 10 working days). Affected persons can submit a written or oral complaint to the contractor, CSF, or the implementing agency. Complaints received by any other institutions will be referred back to the implementing agency for action. The implementing agency will notify the PMO-EO of the complaint within 2 days. The PMO-EO will enter the complaint in the Complaints Register.
   (a) The contractor, in consultation with the implementing agency, attempts to resolve the issue directly with the affected person. Within 5 working days of receiving the complaint, the agency will provide clear advice to the affected person on the proposed corrective action and by when it will be taken. The corrective action will be implemented not later than 10 working days from receipt of the complaint. The PMO-EO will enter the resolution in the Complaints Register.
   (b) If quick corrective action is not possible, or the implementing agency is unsure how to proceed, or the complainant is not satisfied by the initial corrective action, then the complaint will be referred to the PMO-EO for Stage 2.

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

(iii) **Stage 3** (maximum 10 working days). If Stage 2 is unsuccessful (i.e., no solution can be identified, or the affected person is not satisfied with the proposed solution), the PMO-EO will convene a multi-stakeholder meeting and involve the project leading group to ensure that any needed inputs from other project agencies are coordinated. The workshop will identify a solution acceptable to all. The agreed solution will be implemented and a report on the outcome provided to PMO and ADB.
   (a) The above steps relate to the construction phase, where most complaints will be directed in the first instance to the contractor, CSF, or the implementing agency. During initial operations, complaints will be received by the O&M units of the facilities.
   (b) PMO will inform ADB of all complaints and actions under the GRM and include all relevant documents in its progress reports to ADB.

36. The PIA, contractor, and PCC shall accept the complaints/grievances lodged by the affected person free of charge. Any cost incurred should be covered by the contractor or the contingency of the project. The grievance procedures will remain valid throughout the duration of project construction and until project closure.



ADB = Asian Development Bank, AP = affected persons, EEB =ecology and environment bureau, PMO = project management office, GRM = grievance redress mechanism, LRB=land resources bureau; PCC = public complaint center; implementing agency=implementing agency.

Figure EMP-1: Proposed Environmental Grievance Redress Mechanism

J. Mechanisms for Feedback and Adjustment

38. Based on-site inspections and monitoring reports, including internal and external environmental monitoring reports, the PMO with the assistance from the LIEC will decide whether (i) EMP is adequate and effective and further mitigation measures are required as corrective actions, or (ii) some improvements are required for environmental management practices.

39. The effectiveness of mitigation measures and monitoring plans will be evaluated by the external environment monitoring report on EMP implementation. The need to update and adjust the EMP will be reviewed when there are design changes, changes in construction methods and program, negative environmental monitoring results or inappropriate monitoring locations, and ineffective or inadequate mitigation measures.

40. PMOs will play a critical role in the feedback and adjustment mechanism with the support from the LIEC and external environment monitoring expert. Where unanticipated environmental impacts become apparent during project implementation, PMO shall update the environmental

assessment and EMP or prepare a new environmental assessment and EMP to assess the potential impacts, evaluate the alternatives, and outline mitigation measures and resources to address those impacts.

41. Adjustment to the EMP will be made, if necessary. In such cases, the PMO will inform ADB promptly on any changes to the project and needed adjustments to the EMP. The updated EMP will be submitted to ADB for review and approval, and will be disclosed on the ADB project website. Each PMO will assess whether further mitigation measures are required as corrective action, or improvement in environmental management practices are required with the support from the LIEC and external environment monitoring expert.

ANNEX 1 to EMP: COVID 19 – HEALTH AND SAFETY PLAN

Item	Good Practices	Who implements	Who supervises
Awareness materials	• Preparation of awareness materials on COVID-19 e.g., signs, posters. • Installation of awareness signs at work sites, for visibility to workers and the general public.	Contractor	CSF, PMO, PIA, LIEC
Detection Measures	• Control and document the entry/exit to the work site for both workers and other parties. • Prevent sick workers from entering the site through checking temperatures of workers and other people entering the site. Require self-reporting prior to entering the site. • All workers to self-monitor their health, possibly with the use of questionnaires, and take their body temperature regularly. • Thermal screening at the workplace to be considered only in the context of a combination of measures for prevention and control of COVID-19 at the workplace and along with risk communication.	Contractor	CSF, PMO, PIA, LIEC
Physical Distancing measures	• Keep a distance of at least 1 meter between workers and minimize physical contact, ensure strict control over external access, and queue management (marking on the floor, barriers). • Reduce density of people in the building (no more than 1 person per every 10 square meters), physical spacing at least 1 meter apart for workstations and common spaces, such as entrances/exits, lifts, pantries/canteens, stairs, where congregation or queuing of employees or visitors/clients might occur. • Avoid crowding by staggering working hours to reduce the congregation of employees at common spaces such as entrances or exits. • Implement or enhance shift or split-team arrangements, or teleworking. • Minimize the movement of local workers in and out of the site (e.g., avoid workers returning home to affected areas, or returning to site form affected areas). • Minimize the workers' contact with local community.	Contractor	CSF, PMO, PIA, LIEC
Respiratory measures	• All workers should wear a face mask. • If a worker is sick, they should not come to work if a member of staff or a worker feels unwell while at work, provide a medical mask so that they may get home safely. • Where masks are used, whether in line with government policy or by personal choice, it is very important to ensure safe and proper use, care and disposal.	Contractor	CSF, PMO, PIA, LIEC
Hand Hygiene measures:	• Regular and thorough handwashing with soap and water or hand hygiene with alcohol-based hand-rub (a) before starting work, before eating, frequently during the work shift, especially after contact with co-workers or customers, (b) after going to the bathroom, after contact	Contractor	CSF, PMO, PIA, LIEC

Item	Good Practices	Who implements	Who supervises
	with secretions, excretions and body fluids, after contact with potentially contaminated objects (gloves, clothing, masks, used tissues, waste), and immediately after removing gloves and other protective equipment but before touching eyes, nose, or mouth. • Hand hygiene stations, such as hand washing and hand-rub dispensers, should be put in prominent places around the workplace and be made accessible to all staff, contractors, clients or customers, and visitors along with communication materials to promote hand hygiene.		
Cleaning and Disinfection	• Cleaning and Disinfection off all site facilities, including offices, accommodation, canteens, and common spaces. • Cleaning (soap, water, and mechanical action) to remove dirt, debris, and other materials from surfaces. Disinfection of dirty surfaces and objects only after cleaning. • Most common disinfectants – sodium hypochlorite (bleach) of surface at concentration 0.1% or alcohol at least 70% concentration for surfaces which can be damaged by sodium hypochlorite. • Priority disinfection of high-touch surfaces - commonly used areas, door and window handles, light switches, kitchen and food preparation areas, bathroom surfaces, toilets and taps, touchscreen personal devices, personal computer keyboards, and work surfaces. • Disinfectant solutions must always be prepared and used according to the manufacturer's instructions, including instructions to protect the safety and health of disinfection workers, use of personal protective equipment, and avoiding mixing different chemical disinfectants. • Provide appropriate PPEs to the cleaners. • Manage the waste as the medical waste, and dispose of it in accordance with local regulations.	Contractor	CSF, PMO, PIA, LIEC
Response measures if workers found with COVID-19 symptoms	• Workers who are unwell or who develop symptoms consistent with COVID-19 to stay at home, self-isolate, and contact a medical professional or the local COVID-19 information line for advice on testing and referral (consider telemedicine and flexible sick leave policy). • Standard operating procedures to be prepared to manage a person who becomes sick at the workplace and is suspected of having COVID-19, including isolation, contact tracing and disinfection. • People who were in close contact at the workplace with persons with laboratory-confirmed COVID-19 should be quarantined for 14 days from the last time of the contact in accordance with WHO recommendations. • Set out differentiated procedures for the treatment of sick persons, based on the case severity. Pay workers	Contractor	CSF, PMO, PIA, LIEC

Item	Good Practices	Who implements	Who supervises
	throughout periods of illness, isolation, or quarantine. • Set aside a part of worker accommodation for precautionary self-quarantine. • Establish communications with local medical services and refer sick workers to there.		
Adjusting Work Practices and Manage Work Related Travels	• Consider changes to work processes and timings to minimize contact between workers (e.g., decreasing the size of work team, changing to a 24-hour work rotation). • Cancel or postpone non-essential travel to areas with community transmission of COVID-19. • Provide hand sanitizer to workers who must travel, advise workers to comply with instructions from local authorities where they are traveling, as well as information on whom to contact if they feel ill while traveling. • Workers returning from an area where COVID-19 transmission is occurring should monitor themselves for symptoms for 14 days and take their temperature twice a day; if they are feeling unwell, they should stay at home, self-isolate, and contact a medical professional.	Contractor	CSF, PMO, PIA, LIEC
Communication and Contact with the Community	• Carefully manage the relations with the community with clear and regular communication. • Made aware of the procedures put in place at the site to address issues related to COVID-19. • Practice social distancing with the local community.	Contractor	CSF, PMO, PIA, LIEC
Risk communication, training, and education	• Provide posters, videos, and electronic message boards to increase awareness of COVID-19 among workers and promote safe individual practices at the workplace, engage workers in providing feedback on the preventive measures and their effectiveness. • Provide regular information about the risk of COVID-19 using official sources, such as government agencies and WHO, and emphasize the effectiveness of adopting protective measures and counteracting rumors and misinformation. • Special attention should be given to reaching out to and engaging vulnerable and marginalized groups of workers, such as those in the informal economy and migrant workers, domestic workers, subcontracted and self-employed workers, and those working under digital labor platforms. • Train the workers on procedures in place by the project, and their own responsibilities in implementing them.	Contractor	CSF, PMO, PIA, LIEC

ANNEX 2 to EMP: INDICATIVE TEMPLATE OF CONTRACTOR'S SITE-EMP

A. General project information
   - A site-EMP should include the following generation information about the project:
   - A description of the site location and the receiving environment, including the location of sensitive receivers;
   - A description of the project construction works to be undertaken, including timeframes and construction hours;

B. Organization structure of environment management
   - A description of the organization structure of the contractor;
   - Identification of the person with responsibility for implementing the site EMP.

C. Management of the environmental issues

   - Air quality
   - Noise
   - Site contamination
   - Solid waste
   - Wastewater
   - Soil erosion
   - Ecological resources
   - Physical and cultural resources
   - Community health and safety
   - Occupational health and safety
   - Traffic management
   - Emergency response plan;
   - Other issues identified

D. Communication and complaint resolution
   - Description of the communication plant that outlines how and when consultation with potentially affected parties will be undertaken, and how potentially affected parties will be informed in advance of works that may have an off-site impact.
   - Description of grievance redress mechanism

E. Monitoring
   - Monitoring objective
   - The criteria against which monitoring results will be assessed
   - The sampling times and frequency
   - A map showing the sampling locations
   - Parameters to be measured and analyzed
   - A feedback loop from monitoring to corrective actions so that issues arising from monitoring drive the necessary corrective actions.

F. Training
   - To ensure the site EMP is implemented effectively, all workers and employees should be trained in environmental awareness and their responsibilities under the site EMP.