

Environmental Management Plan

February 2022

Cambodia: Second Urban Environmental Management in the Tonle Sap Basin Project

Wastewater and Drainage Subproject, Stueng Saen City,
Kampong Thom Province

Prepared by the Ministry of Public Works and Transport for the Asian Development Bank. This is an updated version of the draft originally posted in May 2018 available on <https://www.adb.org/projects/documents/cam-50102-002-emp>.

CURRENCY EQUIVALENTS

(as of March 2020)

Currency unit	–	riel (KR)
KR 1.00	=	\$ 0.000250
\$1.00	=	KR 4,000

ABBREVIATIONS

ADB	–	Asian Development Bank
BOD	–	Biochemical Oxygen Demand
CDIA	–	Cities Development Initiative for Asia
CEMP	–	Construction Environmental Management Plan
C-EHS	–	Contractor Environmental Health and Safety Officer
CMAC	–	Cambodia Mine Action Center
COD	–	Chemical Oxygen Demand
CRVA	–	Climate Risk Vulnerability Assessment
DDPP	–	Detailed Design and Project Preparation
EA	–	Executing Agency
EIA	–	Environmental Impact Assessment
EMP	–	Environmental Management Plan
FGD	–	Focus Group Discussion
GDR	–	General Department of Resettlement
GHG	–	Greenhouse Gas
GRM	–	Grievance Redress Mechanism
I/NES	–	International and National Environmental Specialists
IA	–	Implementing Agency
IEE	–	Initial Environmental Examination
IEIA	–	Initial Environmental Impact Assessment
EMI	–	Environmental Monitoring Institute
MoE	–	Ministry of Environment
MOWRAM	–	Ministry of Water Resources and Meteorology
MPWT	–	Ministry of Public Works and Transport
PDoE	–	Provincial Department of Environment
PMC	–	Project Management Consultants
PMC-I/NES	–	PIM-International and National Environment Specialists
PIU	–	Project Implementation Unit
PIU-SFP	–	PIU Safeguards Focal Point
PDPWT	–	Provincial Department of Public Works and Transport
PMU	–	Project Management Unit
PMU-ESO	–	PMU Environmental Safeguards Officer
PSC	–	Project Steering Committee
RCP	–	Representative Concentration Pathway
SHC	–	Sewer Household Connection
WWTP	–	Sewage Treatment Plant
SPS	–	Safeguards Policy Statement
TS-1	–	Tonle Sap Urban Environmental Improvement Project
TSBR	–	Tonle Sap Biosphere Reserve
TSS	–	Total Suspended Solid
UXO	–	Unexploded Ordnance

WHO	– World Health Organization
WWTP	– Wastewater Treatment Plant

WEIGHTS AND MEASURES

dBa	- A-weighted Decibel
km	- kilometre
km ²	- Square kilometre
LAeq	- Equivalent Continuous Level 'A weighting' - 'A'-weighting = correction by factors that weight sound to correlate with the sensitivity of the human ear to sounds at different frequencies
m	- Meter
oC	- Degree Celsius
PM10	- Particulate Matter 10 micrometres or less
PM2.5	- Particulate Matter 2.5 micrometres or less
µg/m ³	- Microgram per cubic meter

NOTE

- (i) In this report, "\$" refers to United States dollars.

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1. INTRODUCTION

1.1. Purpose

1. This document is the environmental management plan (EMP) for the Stueng Saen Wastewater and Drainage Subproject, Kampong Thom Province for the Second Integrated Urban Environmental Management in The Tonle Sap Basin Project (TS-2 Project). The EMP for the subproject defines mitigation and monitoring measures and describes the institutions, responsibilities and mechanisms to monitor and ensure compliance. Such institutions and mechanisms will seek to ensure continuous improvement of environmental protection activities during preconstruction, construction, and operation of the subprojects in order to prevent, reduce, or mitigate adverse impacts.
2. The TS-2 Project also includes infrastructure components in the subproject locations of Battambang city, Battambang Province, and Serei Saophoan, Banteay Meanchay Province.
3. The EMP describes how the mitigation and other measures to enhance the benefits of environmental protection will be implemented. It explains how the measures will be managed, who (agency) will implement them, when and where they will be implemented. The following elements will be described in the EMP: (i) implementation of mitigation measures during project design; (ii) implementation of mitigation measures during construction by contractors, and how impacts prevention will be incorporated in the materials procurement; (iii) social development program (e.g., resettlement plan, community training); (iv) contingency response plan for natural or other disasters, and project contingencies; and (v) environmental management and monitoring costs including mitigation costs.
4. The environmental classification of the Subproject is confirmed as Category B. The EMP has been carried out in accordance with the Safeguard Policy Statement (2009) of the Asian Development Bank (ADB), and Cambodia's Law on Environmental Protection and Natural Resource Management (Preah Reach Kram/NS-PKM-1296/36) 1996, and its sub-decrees and implementing guidelines. The EMP is based on the separate Initial Environmental Examination (IEE) of February 2022 and both the IEE and EMP have been updated in conjunction with the finalization of the Detailed Engineering Design (DED) and the subsequent Variation Order No 3 ensuring consistency between engineering designs and environmental mitigation measures. The EMP also incorporates the findings of the Initial Environmental and Social Impact Assessment (IESIA) approved by the Ministry of Environment (MoE) in May 2020. The EMP will be further updated if necessary. The original EMP (May 2018) which was part of an IEE/EMP covering all subprojects under the TS2 Project is available on ADB's website¹.

1.2. Planned Infrastructure Investments

5. The design period of the project is 20 years. The project components and facilities were planned up to Year 2040. The concept designs prepared during the feasibility study stage were used as the basis for preparing the detailed designs. The investment works to be implemented the Stueng Saen Wastewater and Drainage Subproject comprise the following components:
 - Construction of a primary and secondary separate sewage collection network.
 - 9.1 km gravity sewer pipeline
 - 7.5 km pressurized sewer pipeline

¹ <https://www.adb.org/projects/documents/cam-50099-002-iee>

- Construction of tertiary sewer network (32.5 km of Ø160 mm), including 2,930 service connections for households (SHCs), commercial and institutional buildings.
- Construction of two (2) sewer pump stations and associated pumping mains.
- Construction of a 3,500 m³/d WWTP above flood levels.
- Construction of administration, workshop, generator and security buildings at the WWTP site.
- Upgrade and raise 1.5 km of access road to the WWTP above flood levels.
- Construction of 26.8 km stormwater collection network including removal of 19 km existing drainage lines.
- Provision of Operations & Maintenance Equipment.

1.2.1. Location and Service Area

- The selected WWTP site is in Beung Chhumnich Lake, Prek Sbov Village, O Kantor Commune, Stueng Saen City, Kampong Thom Province. The service area for the wastewater network covers three (3) urban sangkats in Stueng Saen City. The location of the WWTP and the wastewater service area are indicated in **Figure 1**, and the planned stormwater drainage network is displayed in **Figure 2**.

Figure 1: Stueng Saen Wastewater and WWTP

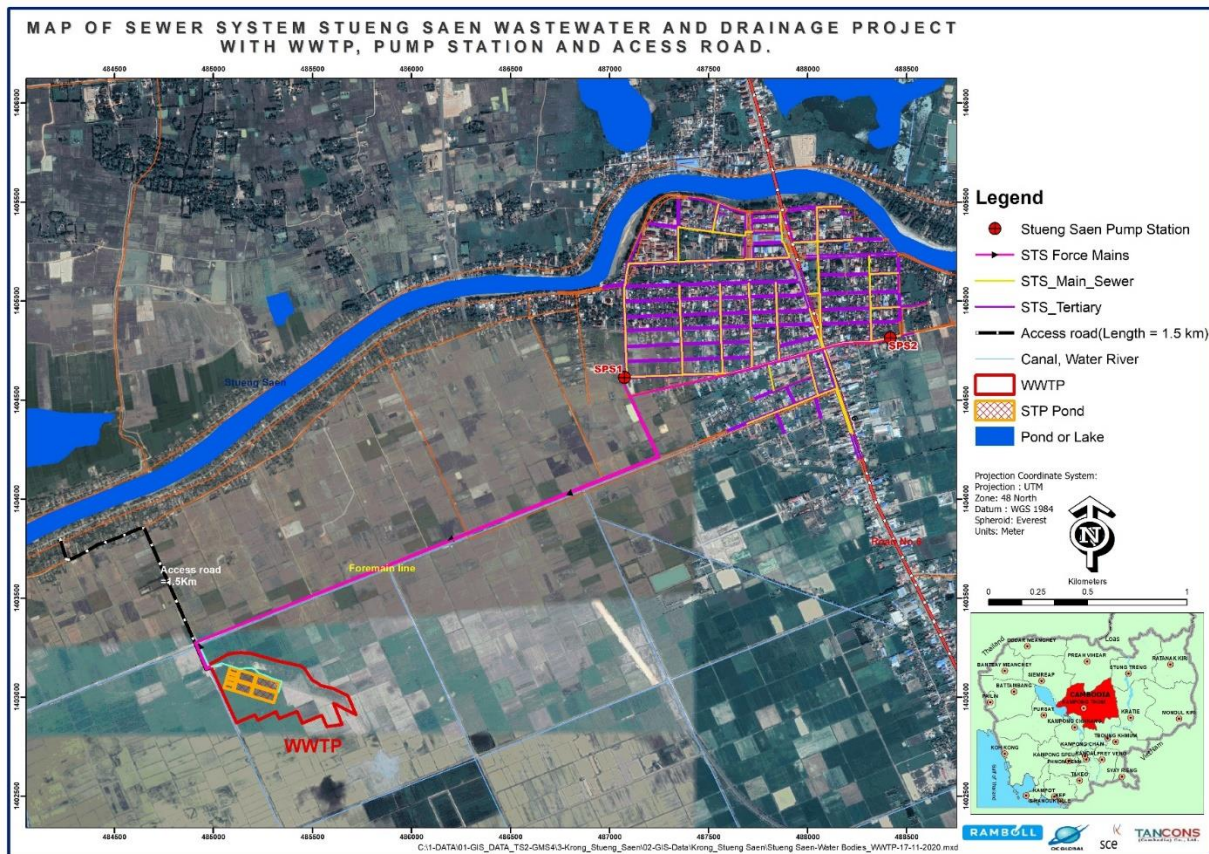
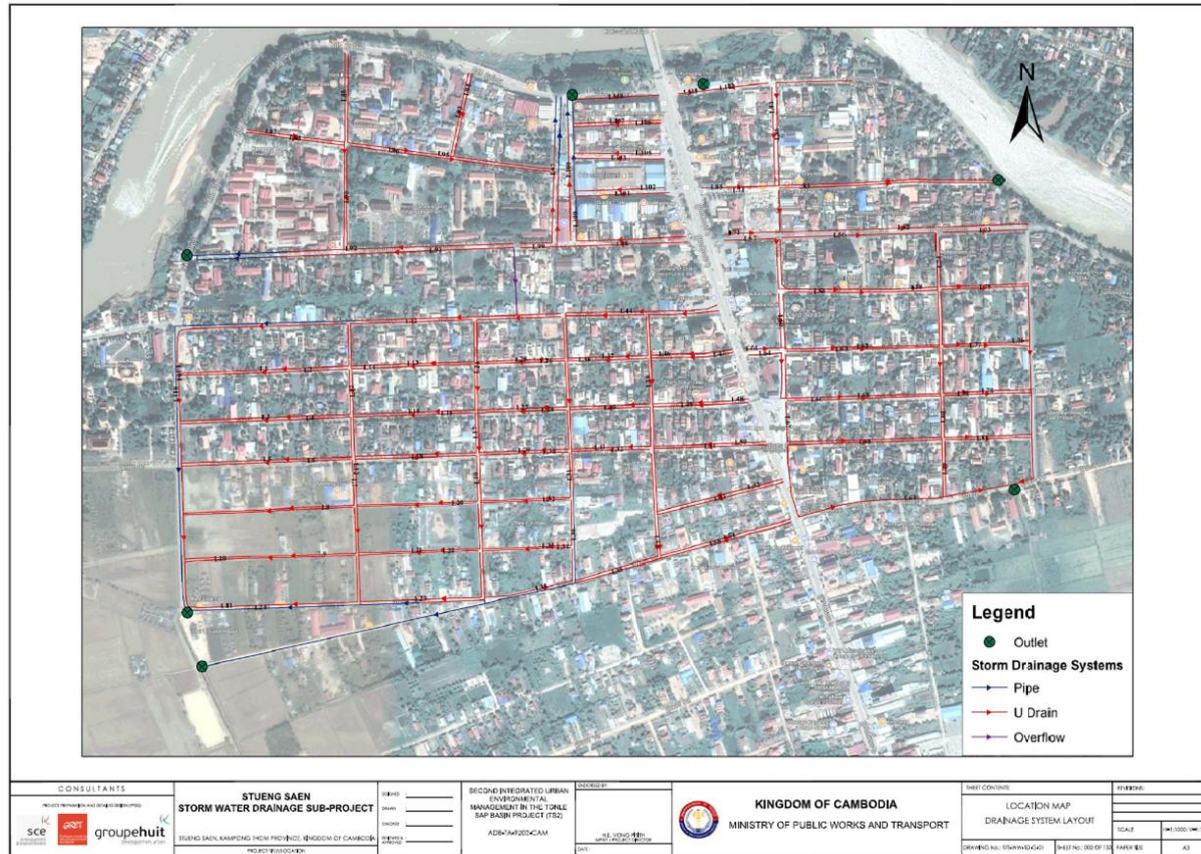
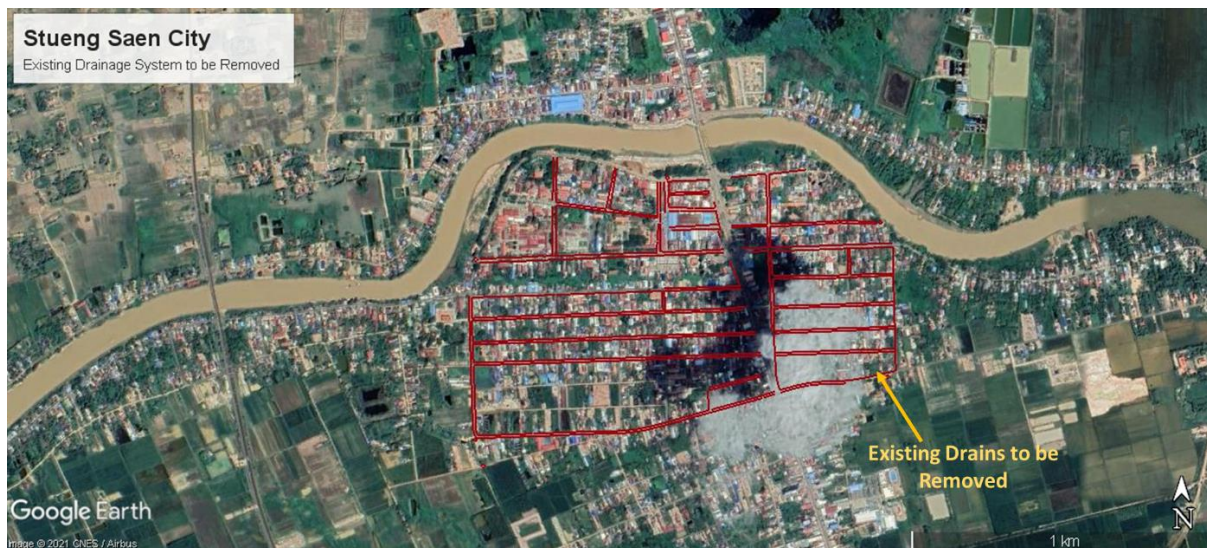


Figure 2: Stueng Saen stormwater drainage network



7. The existing drainage system that will be removed is indicated in **Figure 3**.

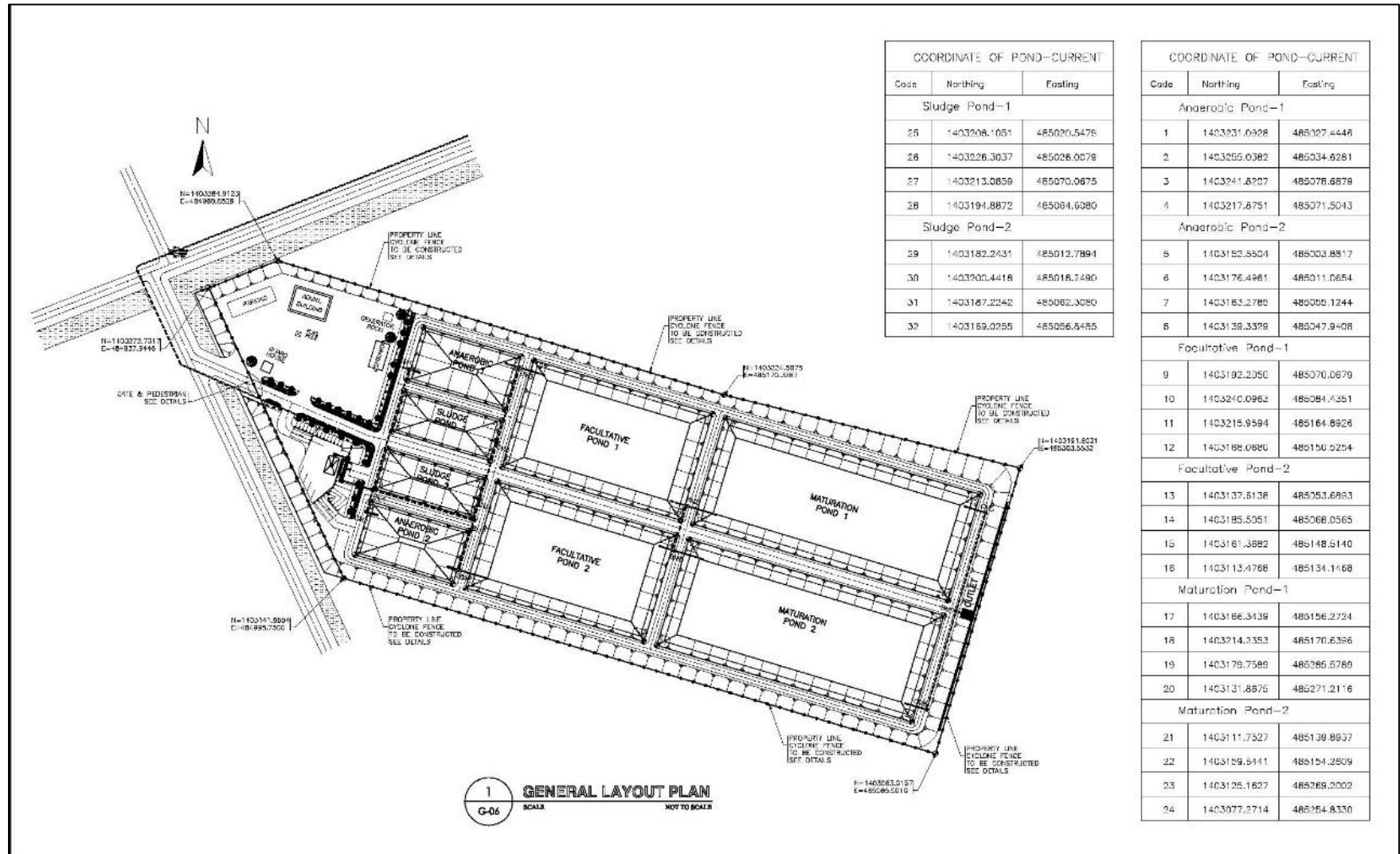
Figure 3 Existing drains to be removed



1.2.2. Technical Approach

8. The layout of the Wastewater Treatment Plant is displayed in **Figure 4**. Waste Stabilization Ponds has been chosen as the most appropriate wastewater treatment technology. This technology consists of a series of different types of waste stabilization ponds (anaerobic, facultative, maturation) that rely entirely on natural processes by algae and bacteria with sunlight as the only energy source. This is a well-established, low-cost, low-maintenance, highly efficient, entirely natural and sustainable technology for domestic wastewater treatment in tropical climates.
9. The Wastewater Treatment Plant for Stueng Saen City comprises a dual series of 2 x anaerobic, 2 x facultative and 2 x maturation ponds. The WWTP is designed to produce a high-quality effluent that will consistently remove BOD, COD, TSS and Total Coliform. Although the design (as is common practice) is based on BOD and faecal coliform removal – for which waste stabilization ponds are very effective - and not on removal of nutrients from the wastewater, the processes do also contribute to nutrient removal.
10. The main WWTP process components and units include (see **Figure 4**):
 - Inlet Screening Structure with channels for manually cleaned main screen and bypass screen;
 - Septage Receiving Structure with manually cleaned screen and washing area;
 - Two (2) Anaerobic Ponds in parallel each 5 m deep, 25 m wide and 46 m long;
 - Two (2) Facultative Ponds in parallel each 2.5 m - 3.0 m deep, 50 m wide and 84 m long;
 - Two (2) Maturation Ponds in parallel each 1.5 m deep, 50 m wide and 120 m long;
 - Two (2) Sludge stabilization/drying ponds each 19 m wide and 46 m long. sludge will need to be removed after 3-5 years.

Figure 4: WWTP Layout



Source: Detailed Engineering Design Report, SCE 2019

2. SUMMARY OF POTENTIAL RECEPTORS & IMPACTS

11. The key subproject components and the proximity to relevant receptors are presented in **Table 1** and displayed in **Figure 5** and **Figure 6**.

Table 1: Summary of Subproject Components and Environmentally Sensitive Receptors

Subproject Component	Surface Water Receptors	Socio-Economic & Cultural Receptors	Land Cover/ Ecological Receptors	Protected Area Status
Wastewater Treatment Plant	Effluent discharge to irrigation canals surrounding the site and then to Stueng Saen River about 1 km from the WWTP	School: 1 km northwest at Prek Sbov Nearest housing 800 m north of the WWTP Distance to City: 3 km	Lowland rice fields	None
Wastewater Collection System	None	The subproject is in town, there are: houses, school, hospital, offices, markets, shops, and pagodas and local utility services along the road	The town area	None
2 Pump Stations (PS1 and PS2)	None	Housing across the road (<50 m)	Peri-urban, gardens, some cultivation, shrubs, trees	None
Stormwater Drainage System	Discharge to Stueng Saen River	Urban area with houses, school, hospital, offices, markets, shops, and pagodas and local utility services along the roads	Road and roadsides with street trees	None
Proposed Septage Disposal Site (septage from houses disconnected to the drainage system during construction)	1.8 km east of lake	650 m south of residential area along Road No 6 400 m to nearest single houses along local road	Agricultural land use	None

Figure 5 Subproject Components and Relevant Receptors

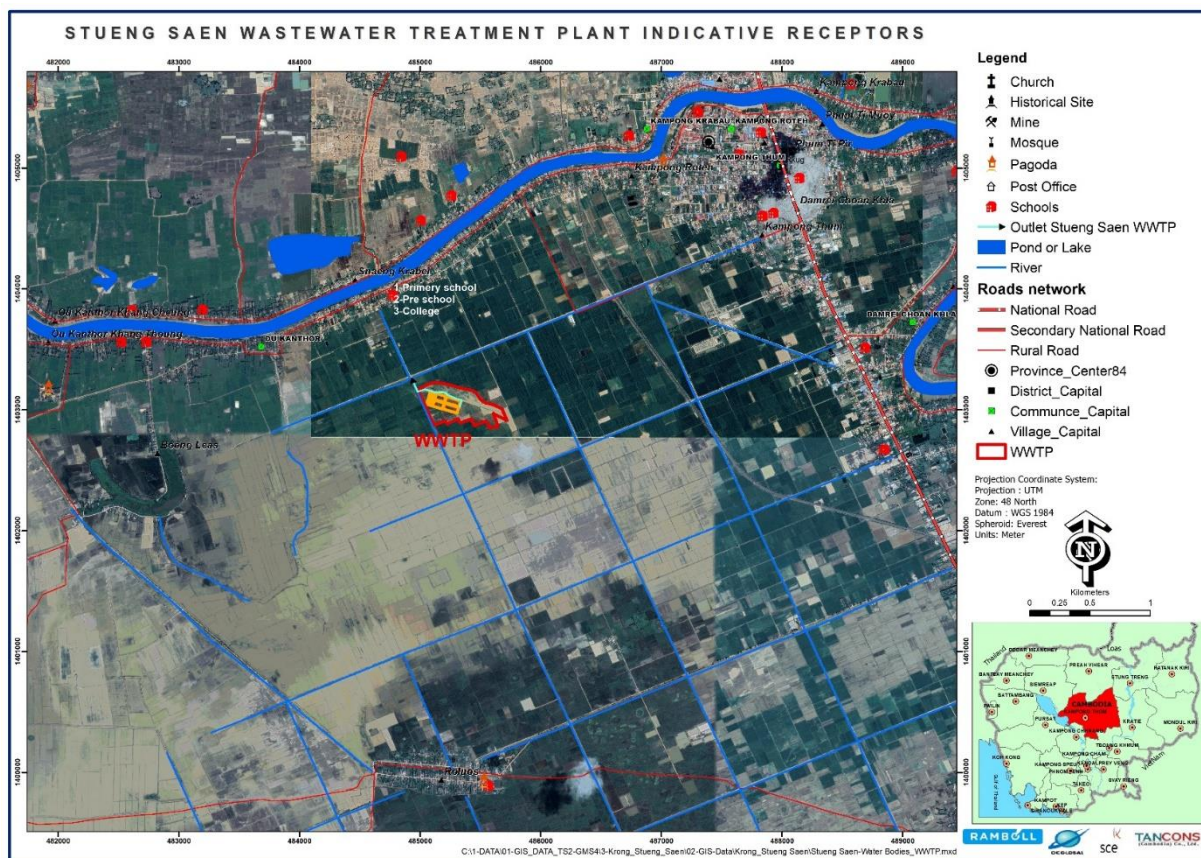
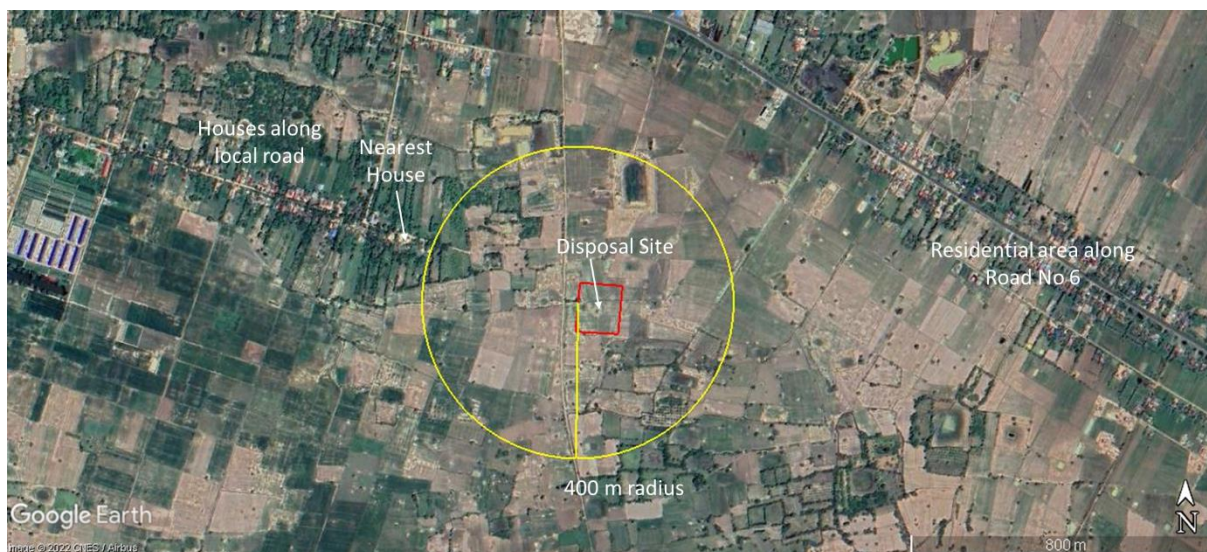


Figure 6 Receptors near the proposed septage disposal site



12. A summary of potential adverse impacts on the receptors is presented here below:

- **Air Quality.** Moderate temporary air quality impacts during the construction stage of the subproject are anticipated due to fugitive dust generation associated with all construction works, earth works and waste movement. Odour could be an impact during WWTP and pump operation, if those facilities are not operated properly.
- During the operation of the WWTP generation of nuisance odour may occur. The most likely sources of odour are the inlet chamber, the anaerobic ponds and the septage receiving facility. The WWTP will be in an open paddy field area with a buffer of about 800 m to the nearest houses ensuring that any release of nuisance odour from the WWTP will not impact the local residents. Monitoring of generation of offensive odour at the WWTP is included in the EMP.
- At the pumping stations (during operation), with proper operation and maintenance nuisance odours are not likely; however, this will be closely monitored, and the stations will be made ready for installation of odour control measures should this be warranted.
- **Noise.** Noise impacts will be temporary and localized at all construction sites as construction machinery and vehicles generate noise as they operate. Other noise sources include loading and unloading of construction equipment and materials.
- No noise impacts are expected during normal operation of the pumping stations, since the stations will be equipped with submersible pumps installed in wet wells approximately 6 m below ground surface, and the emergency generators will be installed in separate buildings with adequate noise attenuating provisions to meet all exterior noise level requirements.
- The operation of the WWTP does not involve any activities that would generate significant noise emissions, and due to its location approximately 800 m from the nearest residences, any occasional noisy activities are unlikely to cause any significant impacts.
- **Surface Water.** Construction will take place in areas which have a network of irrigation canals, used for both household water requirements such as laundry and bathing as well as for fishing. Short term construction impacts may be seen in terms of increased turbidity, when access roads improvement or other construction is taking place adjacent to the canals. Also, some construction activity will be required at the riverbank where outfalls for drainage are required. Effluent discharges will also negatively impact on water quality and water users, if the design discharge standards are not met.
- No significant impacts on surface water are expected during the operation of the sewer and drainage networks, pumping stations and the WWTP. The WWTP effluent will be discharge to an irrigation canal next to it that is connected to Stueng Saen River as indicated in **Figure 7**. The WWTP is designed to comply with effluent standards for public water area and sewer (see **Annex 4**) and simple mass balance calculations based on a conservative dry season low flow in the Stueng Saen River of 2 m³/s and the design treatment capacity of 3,500 m³/d or approx. 0.04 m³/s indicate that the resulting concentrations of key water quality parameters in Stueng Saen River after mixing with the effluent are well within the Cambodian ambient water quality standards. In addition, during the dry season, it is likely that most of the effluent will be used for irrigation; and in the rainy season with flows in the hundreds of m³/s in Stueng Saen River, the effect of the effluent discharge on the river water quality will be negligible.

Figure 7: Discharge flow path from the WWTP to Stueng Saen River



- In terms of using the treated effluents for irrigation, as a general rule, a waste stabilization pond system comprising anaerobic, facultative and maturation ponds produces an effluent suitable for unrestricted irrigation. The microbiological quality guidelines for wastewater use in agriculture recommended by FAO also indicate that the treated effluents can be used for irrigation of cereal crops, industrial crops, fodder crops, pasture and trees. Specific microbiological analyses will be undertaken upon start of operations based on the actual strength of the raw wastewater and the performance of the treatment system to determine if the effluent can be used for unrestricted irrigation and aquaculture.
- **Soil and Land.** Soil erosion is not anticipated given the nature of the subproject and their flat locations, however, borrow sites may cause local impacts to the land. The subproject is in fertile agricultural locations and fertile topsoil is a valuable resource which requires protection measures, particularly for the construction areas which are located in and around rice fields where encroachment from inappropriate spoil disposal could have detrimental impacts.
- **Solid Waste Management.** Impacts on resource use and impacts associated with disposal may arise from waste generated during construction. This includes generation of inert wastes e.g. spoil, biodegradable wastes (cleared vegetation), and hazardous wastes (oily wastes). Poor waste management can lead to impacts such as wind-blown litter, contamination of water bodies or soil, and other impacts on public health for example from open burning of waste.
- **Community and Occupational Health and Safety.** Construction sites and access roads will present health and safety risks not only to construction workers, but also to people living and working around the sites. Community risks come from unauthorized access to construction sites and construction traffic i.e. heavy vehicles which the community may not be used to on their neighbourhood roads. Occupational risks come from a range of activities including the use of heavy machinery, earth moving, and use of chemicals. The sewer and drainage construction activities will affect local business and decrease their income. Due to COVID-19 pandemic, workers and staff at constructing site can be infected by the virus, then some prevention and mitigation measures need to be applied.

Contractor will prepare standard operation plans and comply with applicable government regulations and guidelines on COVID-19.

- **Socio-Economic Impacts (accessibility).** The installation of sewage pipes will require the excavation of parts of the road network. This is in urban areas where businesses and other activities take place. The community in and around these areas will be disrupted by the noise and dust, as described above, and by potentially impaired access (for themselves and their customers) to their properties and businesses. The community will have temporary impact on pavements/walkways, kerbs, minor secondary structures (signposts, eaves) and need for relocating small businesses for interim period during construction. Temporary impacts will be responsibility of the construction contractor.
- **Disposal of Septage during Construction.** This concerns septage from households disconnected to the drainage system due to removal of the existing drainage lines before the new sewage pipes are installed. Septage may contain bacteria, viruses, and parasites that can cause diseases and therefore pose a risk to public health and the environment. The highest risks include the risk that septage comes in contact with groundwater or surface water used for domestic consumption, the risk of contact with crops used for human consumption, and the risk of direct exposure for workers handling the septage, for people accessing sites where septage has been deposited, and the risk of direct exposure or pollution of water bodies due to spills.
- Septage has a strong nuisance odour which is a concern during handling and after land application, however, a well-managed operation that incorporates lime stabilization, subsurface injection, or burial creates minimal odour emissions.

3. INSTITUTIONAL ARRANGEMENTS & RESPONSIBILITIES

13. The framework for implementation of the EMP for the project is described in this section. The key institutions, organizations and stakeholders relevant to environmental safeguards are set out below.
14. The overall responsibility for EMP implementation and compliance with loan assurances lies with the Executing Agency (EA), the Ministry of Public Works and Transport (MPWT). The EA will establish a Project Management Unit (PMU) based in Phnom Penh, responsible for general project implementation. The Implementing Agency is the Provincial Department of Public Works and Transport (PDPWT) in each subproject city. The PDPWT will establish a Project Implementation Unit (PIU) in each province, comprising relevant provincial government representatives including the Provincial Department of the Environment.
15. A summary of the key functions for project implementation and environmental safeguards is presented in **Table 2** for ease of reference.

Table 2: Key Roles for Project Implementation

Role	Abbreviation	Location	Summary of Overall Function
Ministry of Public Works and Transport	MPWT	Phnom Penh	Accountable towards the Royal Government of Cambodia and ADB for the implementation of the Subproject and for ensuring compliance with loan covenants
Project Steering Committee	PSC	Phnom Penh	Policy and technical guidance for subproject implementation
Project Management Unit	PMU	Phnom Penh within MPWT	Responsible for general project implementation and reporting
PMU Environment Safeguards Officer (funded through the TS2 Loan)	PMU-ESO	Phnom Penh within PMU	EMP compliance across the subprojects for environmental safeguards – Full Time
Project Implementation Unit	PIU	Within Kampong Thom PDPWT	Responsible for subproject implementation
PIU Safeguards Focal Point	PIU-SFP	Provinces within PIU	Responsible for subproject environmental and social safeguard monitoring – Full Time
Contractor's Environment, Health and Safety Officer	C-EHS	Construction Sites	Ensuring compliance with applicable Cambodian environmental, health and safety legislation and with relevant IFC Environmental, Health and Safety guidelines
Project Management Consultants	PMC	Phnom Penh	Project final design and implementation, support and capacity development Engineering supervision for all construction and reporting
International and National Environment Specialists	PMC-I/NES	Phnom Penh within PMC team	Environmental safeguards and reporting support during design and implementation - Intermittent

Role	Abbreviation	Location	Summary of Overall Function
Asian Development Bank	ADB	-	Review project progress, compliance with covenants and advise on corrective actions
Ministry of Environment (MOE) / Provincial Department of Environment (PDoE)	MoE/PDoE	Phnom Penh / Kampong Thom Province	Collaborate with project to provide policies or environmental standards and advise. Observer and conduct environmental monitoring of the project activities based on the mandate.

16. A Project Steering Committee (PSC) will be created to provide policy and technical guidance for subproject implementation. The PSC is chaired by the EA and comprises relevant ministry of provincial departments representatives including the Ministry of Environment, General Department of Resettlement (GDR) and Ministry of Labor as a minimum.
17. External support to the IA/PIU for EMP implementation during the project detailed design and implementation phase will be provided by the International and National Environment Specialists (I/NES) of the Project Management Consultants (PMC). An external Environmental Monitoring Institute (EMI) will be engaged to conduct the field sampling and laboratory analyses of environmental quality (e.g., water quality, air quality) that cannot be performed by other functions within the project. In Cambodia, this can be performed by qualified staff from the Ministry of Environment (MoE).
18. ADB is responsible for reviewing project progress reports and semi-annual environmental safeguards monitoring reports and undertaking review missions to ensure the project is implemented in line with project environmental safeguard requirements, SPS (2009) and Royal Government of Cambodia regulations and guidelines.
19. The EA will be accountable for project implementation and operation on behalf of the Royal Government of Cambodia. The responsibilities of the EA in relation to environmental safeguards requirements are summarized below:
 - (i) Overall responsibility for subproject implementation and management of the Project Management Unit (PMU);
 - (i) Recruit and manage qualified ESO for PMU;
 - (ii) Recruit and manage Project Management Consultants;
 - (iii) Ensure compliance with Loan Covenants;
 - (iv) Approve procurement plans, bidding documents, bid evaluation and contract awards including EMP;
 - (v) Submit regular quarterly and annual subproject reports to ADB including summary on EMP and GRM implementation;
 - (vi) Ensure compliance of subproject/component implementation with ADB and Government social and environmental policies, guidelines and plans;
 - (vii) Approve proposed corrective actions in the event of identified impacts or non-compliance issues identified in monitoring and evaluation reports.
20. The responsibilities of the IA in relation to environmental safeguards requirements are summarized below:
 - (i) Coordinate and monitor subproject implementation activities including all environmental safeguards activities;

- (ii) Coordinate capacity development program for PIU;
- (iii) Obtain necessary approvals from respective departments and other institutions prior to awarding of civil works contracts;
- (iv) Support PMU-ESO in the implementation of EMP;
- (v) Coordinate regular reporting of PMU to EA on EMP implementation;
- (vi) Undertake regular quality control inspection of subproject facilities;
- (vii) Manage the handover of subproject facilities to agencies responsible for operation and maintenance;
- (viii) Ensure PIU engage with and follow the Grievance Redress Mechanism GRM.

21. Specific environmental safeguard of EMP responsibilities are set out for each project phase as shown in **Table 3**.

Table 3: EMP Responsibilities

Responsible Entity	Project Preparation	Engineering Detailed Design	Tendering & Pre-construction	Construction	Operation
Executing Agency	Ministry of Construction and Urban Development responsible for ensuring the implementation of the mitigation in the EMP and for ensuring compliance with loan covenants				
PMU / PMU-ESO		Update IEE/EMP if needed	Engage PMC & PMU-ESO	Ensure EMP is implemented, and that the contractor(s) abide by the EMP	
		Review updated EMP	Coordinating the tendering process including overseeing incorporation of EMP clauses into the bidding documents	Supervising project construction (with support of PMC engineers)	
		Confirm that mitigation measures have been included in engineering detail design	Ensuring the procurement of environmentally responsible contractors and approve CEMP	Prepare and submit quarterly and annual reports including environmental safeguard reporting to ADB	
			Ensuring that domestic EIA approvals by MoE have been secured prior to the awarding of civil works contracts		
			Dissemination and coordination of Grievance Redress Mechanism	Ensure EMP implementation and submit regular monitoring reports to IA and EA	
				Ensure PIU-SFPs undertake regular site inspections as part of progress reporting	
PIU-SFP			Attend all pre-construction training courses regarding EMP implementation	Working closely with the contractors to ensure EMP implementation	
				Support GRM	
				Support Progress Monitoring and Reporting requirements working with PMU-ESO	
				Conduct consultation interviews with affected people	
Project Management		Engage appropriate engineer and safeguards staff	See PMC-I/NES	See PMC-I/NES	Operator training and support as per ToR in PAM

Responsible Entity	Project Preparation	Engineering Detailed Design	Tendering & Pre-construction	Construction	Operation
Consultants PMC		Finalise Detailed Engineering Design in accordance with Environmental Safeguard principles			
Project Management Consultants PMC (PMC-I/NES)]		Update IEE/EMP if needed	Providing training on EMP supervision and GRM to PMU, PIU and contractors	Coordinate public consultation with PMUESO / PIU-SFP	Organize, prior to project completion report (PCR) mission, a survey to assess community satisfaction with project implementation and EMP implementation performance. Draft environment sections of the PCR.
			Setting up environmental management and internal monitoring systems at PUSO and civil works contracts level	Preparing annual EMP progress reports	
			Review tender and contractor documents	Identifying environment-related implementation issues and necessary corrective actions	
			Review contractor CEMPs	Training of PMU, PIU and other stakeholders GRM and EMP implementation	
			Ensure grievance redress mechanism established		
			Regular EMP and implementation monitoring		
			Coordinate public consultation	Organize, prior to project completion report (PCR) mission, a survey to assess community satisfaction with project implementation and EMP implementation performance. Draft environment sections of the PCR	
Contractor			Prepare Construction Environmental Management Plan and provide environmental track record in bid response. Obtain approval of the CEMP from PMU before starting any works at site.	Ensure sufficient funding and human resources for proper and timely implementation of required mitigation and monitoring measures in the EMP throughout the construction phase	Ensure handover of sites is in accordance with EMP and any corrective actions identified in PCR are completed.

Responsible Entity	Project Preparation	Engineering Detailed Design	Tendering & Pre-construction	Construction	Operation
				Appoint an environment, health and safety (EHS) officer to oversee EMP implementation related to environment, occupational health and safety on construction site Ensure health and safety Implement mitigation measures Act as a local entry point for the project GRM and collaborate with PMU on all GRM issues	
External Monitoring Institute			Undertake specialised environmental monitoring as contracted by PMU	Undertake specialised environmental monitoring as contracted by PMU	Undertake specialised environmental monitoring as contracted by Operator
Operator				Testing prior to commissioning to ensure discharge standards can be met (WWTP)	Ensure proper operation of project facilities according to design standards & monitoring Allocation of budget for O&M

3.1. Institutional Capacity Review and Needs

22. Currently there is little experience of monitoring and implementing environmental mitigation measures particularly at a provincial level. There is little enforcement of environmental or health and safety legislation and routine environmental monitoring is not undertaken apart from in major urban centres (air quality) or major rivers (water quality).

23. During the preparation of this IEE and EMP the team checked the capacity and experience at MPWT and found that there are a number of people who have fulfilled the role of 'focal point' for safeguards on project-by-project basis, and there is an established safeguards team within the ministry of six people. This team have experience of working on highways projects but have not to date been involved with urban development projects and are willing to be involved in any training and site visits required during project implementation and will be issued copies of relevant monitoring reports, EMPs and other relevant safeguards documents.

24. In addition, through understanding existing operations for the existing wastewater treatment operations. It is clear that there is limited ability for operation and maintenance. The limiting factors affecting the operators' ability to maintain adequate standards are likely to be a function of (i) a lack of technical capacity and experience; and (ii) insufficient budget.

25. A training program is set out in **Table 4** which addresses the safeguard reporting and implementation requirements during construction, and the environmental and social risks from operations.

26. The engagement of a National Environmental Specialist for 10 months spread throughout implementation will be critical to ensuring the capacity of the PIU staff and to ensuring monitoring and reporting are managed effectively during implementation. This person will also work closely with the PMU Environment Safeguards Officer (PMU-ESO) in order to ensure safeguards are implemented and monitored.

27. Training for EMP implementation. The proposed training required for project implementation is set out in **Table 4**. For budgeting purposes, refer to Feasibility Report Volume 5, Institutional Strengthening and Capacity Building. Specifically, the training requirements for the project set out in the relevant Terms of Reference include:

- Train PIUs, contractors, municipalities, and other relevant stakeholders on the implementation of EMPs.

28. Training for investment sustainability. The importance of training in wastewater operations and management should be emphasized if the investment in wastewater treatment is to be sustainable and adequate operations are maintained as per the design. This is also relevant to WWTP operations. Therefore, the Feasibility Studies for the landfills and WWTP include details on operator training. For budgeting purposes, refer to Feasibility Report Volume 5, Institutional Strengthening and Capacity Building. Specifically, the training requirements for the project set out in the relevant Terms of Reference include:

- Develop an operation and maintenance manual for each wastewater plant and collection system, and a training program on the operations manual provisions;
- Train operators on plant equipment at the wastewater treatment plant sites;
- Train operators on achievement of, and compliance with, regulatory standards and monitoring of the performance of the facilities;
- Train WWTP operators and maintenance staff on management of the wastewater system, odour control, operational control of treatment efficacy, compliance with effluent standards, sludge disposal and other environmental controls related to the operation of the WWTP.

Table 4: Capacity Building and Training Requirements

Subject / Content	Participants	Trainer/ Organisation	When/ Frequency	Duration (days / event)	# of participants	Cost (\$) USD
EMP adjustment and implementation - Development and adjustment of the EMP, roles and responsibilities, monitoring, supervision and reporting	PMU, PIU, contractors	I/NES of Project Mgmt Consultants	Twice - Once prior to, and once after 6 months of construction	2	10	For costs and details see: Feasibility Report Volume 5, Institutional Strengthening and Capacity Building
Grievance Redress Mechanism – roles and responsibilities	PMU, PIU, contractors, Commune Councils	I/NES of Project Mgmt Consultants	Twice - Once prior to, and once after 6 months of construction	1	10	
Environmental protection Pollution control on construction sites (air, noise, wastewater, solid waste)	PMU, PIU, contractors	I/NES of Project Mgmt Consultants	Once (during project implementation)	2	10	
Environmental monitoring - Monitoring methods, data collection and processing, reporting systems	PMU, PIU, contractors, Operators of Landfill and WWTP,	I/NES of Project Mgmt Consultants & MoE (environmental analyst)	Once (at beginning of project construction)	2	10	
WWTP Management	Included as part of the WWTP investment training budget					

4. MITIGATION MEASURES PLAN

29. Comprehensive mitigation measures are set out for the subproject in **Table 6**. In addition, subproject specific monitoring programmes are set out in **Table 8** and **Table 9**.

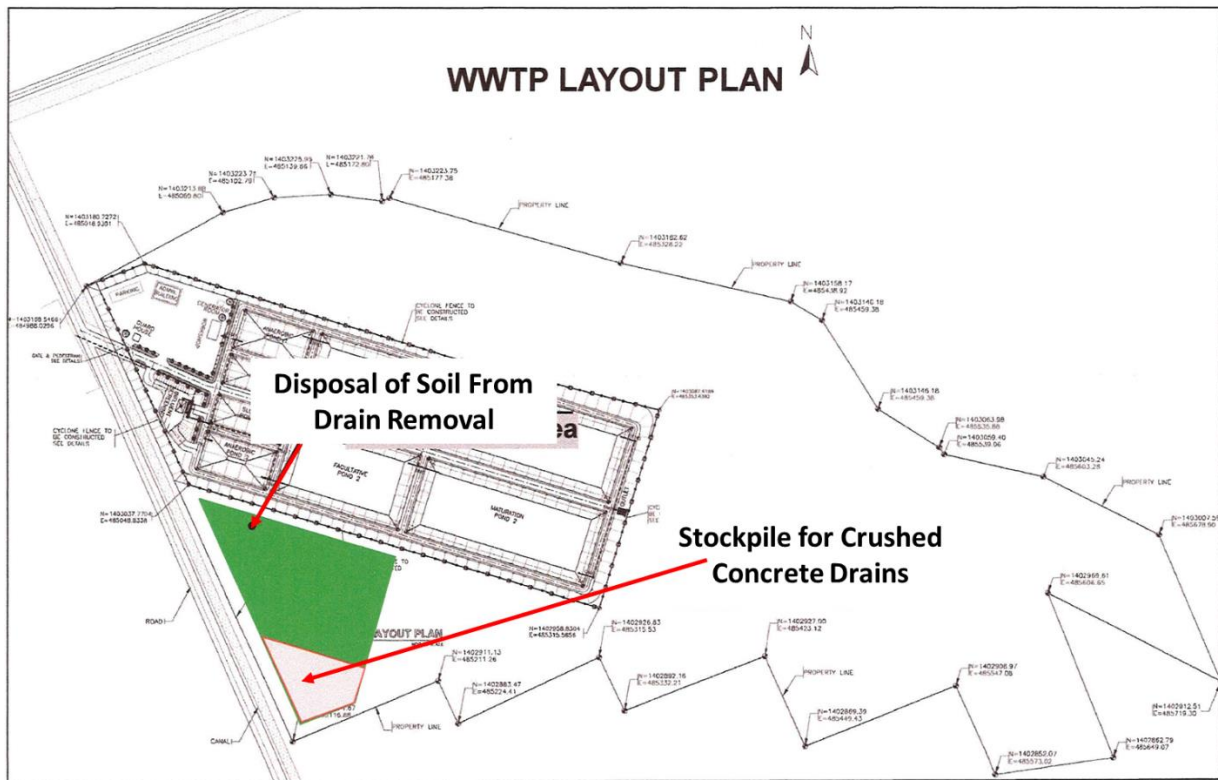
30. **Construction Environmental Management Plan (CEMP)**. The Contractor has developed a CEMP which is a detailed plan which sets out the contractor's approach to ensure compliance with applicable laws and regulations and the mitigation measures stipulated in this EMP.

31. **CEMP Subplans**. The contractor has developed the following specific subplans withing the CEMP prior to the start of the work:

- Construction Materials Acquisition, Transport, and Storage Subplan
- Spoil Management Subplan
- Solid and Liquid Construction Waste Subplan
- Noise and Dust Subplan
- Utility and Power disruption Subplan
- Utility and Power disruption Subplan
- Tree and Vegetation removal, and site restoration Subplan
- Erosion control Subplan
- Worker and Public Safety Subplan
- Construction and Urban Traffic Subplan
- Construction Drainage Subplan
- COVID-19 Health and Safety Plan.

32. **Disposal of Spoil Materials from Removal of Existing Drainage Structures**. The removal of the existing drains includes excavation and disposal of about 10,000 m³ of soil and 2,700 m³ (6,450 tons) of concrete structures. The excess soil will be deposited within the WWTP site boundaries as indicated in **Figure 8**. The concrete structures shall be excavated with great care not to damage the elements and salvageable concrete elements shall be handed over to the municipality for reuse in other projects. The remaining concrete shall be crushed, and rebar shall be separated for sale as scrap metal. The crushed concrete shall preferably be used for slope stabilization (including stabilization of the soil deposit slopes), or as aggregate in construction works to the extent that the materials have the required properties. The crushed concrete may be stockpiled next to the soil deposit as indicated in **Figure 8**. Usage for other ongoing construction works in the city should also be considered. Any unused concrete may be deposited together with the soil. Required mitigation measures are included in **Table 6**.

Figure 8 Disposal Site for Soil and Concrete from Removal of Existing Drains



33. **Method Statement for Management of Septage during Construction.** Prior to undertaking any work under Variation Order No. 3 that would require disposal of septage, the Contractor shall prepare and submit a method statement on septage management that to the satisfaction of PMU/PMC demonstrates full compliance with the requirements stipulated in this EMP (**Table 6**).
34. The Contractor shall demonstrate that the proposed septage disposal site complies with the selection criteria indicated in **Table 5**. The method statement shall include topographic maps and satellite images in proper scale where the site and receptors are clearly marked. The method statement shall include site layout drawings indicating surface drainage and any trenches or pits to be excavated for disposal of septage.

Table 5: Septage Disposal Site Selection Criteria

Site Selection Criteria	Proposed Site Conditions ²
Preferably on agricultural land or other non-public land	
At least 75 m from groundwater well	
At least 500 m from residential area and 150 m from single houses	
No direct drainage to surface lake, river or stream	

² This shall be filled in by the Contractor and included in the method statement to be submitted to PMU/PMC for review and approval

Site Selection Criteria	Proposed Site Conditions ²
Not in ecological sensitive area (e.g. Protected Area or Key Biodiversity Area or on land that hosts Threatened (IUCN Red List) plant or animal species	
Not in wetlands, waterways or in riparian zones	
Not in land with spiritual, cultural, historical or archaeological value	
On flat land with slope not exceeding 2%	
In an area with depth between the bottom of septage trenches or pits and the seasonal high groundwater table would at least be 2 m	
Not in a flood prone area	

35. Prior to execution of any work under Variation Order No. 3 that would require disposal of septage, the PIU together with the Contractor will consult with the affected households and obtain their consent to the proposed septage removal process.

Table 6: EMP Mitigation Measures for Steung Saen Wastewater and Drainage Subproject

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
Pre-Construction Phase					
National IEIA Approval	All	1. The Initial Environmental and Social Impact Assessment (IESIA) has been approved by the Ministry of Environment 2. Baseline environmental surveys have been undertaken as required by MoE	PMU-PMC Local Firm	MoE	Included in project cost
Design	Effluent Discharge	3. Final design ensures that the effluent will meet the criteria in Sub-decree, No. 27 ANRK.BK on Water Pollution Control, MoE, 1999 (c water area and sewer).	PMC-NIES	PMU	Part of Contract Cost
Disclosure and engagement of community through consultation	No community impacts	4. The final design takes into account measures to minimise odour problems at the pumping stations and at the WWTP 5. Initiate Information Disclosure and Grievance Redress Mechanism of IEE 6. Consultation of community based on final detailed designs	PMU-ESO/ PIU-SFP	EA	Included in PMC cost package
Unexploded Ordnance (UXO) survey, & removal	Injured worker or public	7. Ensure national military is consulted to confirm all relevant areas are clear from UXO. This includes: a) All land to which is used for resettlement purposes (for people/businesses/ farmland) b) All construction sites including 50 m either side of any access roads c) All associated areas including borrow sites. 8. Cambodian Mine Action Centre (CMAC) to clear areas where necessary and provide evidence of clearance to PMU in advance of construction. 9. As evidence, submit a certificate of UXO clearance and attach it as annex to the subsequent monitoring report to ADB once the certificate of clearance has been awarded.	CMAC	PMU	To be confirmed as required
Flora survey for protection or cutting	Impacts to flora and fauna habitat	10. Survey for trees higher than 3 m within the construction area for protection or removal. Ensure DWPT and local authority have been informed and obtain the permit for tree cutting. Addition replantation shall be sought upon completion of the work	Contractor	PMC, PMU	Include in bid price
Final Design	Flooding/ Climate Change	11. Final design incorporates adequate cross drains on all facility access roads to ensure any roads raised above natural flood level do not cause ponding or further flooding elsewhere.	PMC	EA	Included in consultancy contract price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
Final Design	Emergency Response Plan	12. Ensure the operational and maintenance plan for each facility includes an emergency response plan considering flooding.	PMC	EA	Included in consultancy contract price
IEE and EMP Updated	All	13. The IEE and EMP have been updated reflecting the final detailed design and the subsequent Variation Order No. 3	I/NES	PMU	Included in project cost
Construction EMP (CEMP) Approvals	All	14. Prepare and develop CEMP by contractor and Approval of CEMP by consultant and PMU, including site maps as required by CEMP.	Contractor	PMC, PMU / EA	Included in project cost
GRM	Dissemination	15. Erect sign boards with project details and GRM procedures/contact details at the entrance to each construction site/camp. 16. PMU to provide contractor with GRM contact details which the contractor will use to print 'GRM Contact Cards' for its staff to hand to complainants and will keep cards with all vehicles, machinery and site managers/foremen. 17. Contractor to raise awareness of all workers on how to respond when an affected person or member of the public has a complaint i.e. direct the person to the most senior site manager present at the time and provide a 'GRM Contact Card'.	Contractor	PMU/ PIU/ PMC	Included in bid price
Construction Phase					
Civil works	Air quality	1. Asphalt and concrete batching facilities will be located at least 500 m downwind from the nearest dwellings in order to reduce the impact of fumes on humans and to be fitted with necessary equipment such as bag house filters to reduce fugitive dust emissions. 2. Water will be sprayed for construction sites, material handling areas, and borrow pits where fugitive dust is generated. 3. Trucks carrying dry and loose construction materials such as earth will be covered with tarpaulins or other suitable cover. 4. Construction vehicles and machinery will be maintained to a high standard to minimize emissions. 5. Areas in which road excavations are required for sewage and drainage pipe works will be notified adequately 1 month in advance of works starting.	Contractor	PMU/PMC	Included in bid price
Civil Works	Noise	6. Maintain all exhaust systems in good working order; undertake regular equipment maintenance;	Contractor	PIU/PMU/ PMC	Included in bid price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		7. Restrict construction activities using heavy machinery work between 8am-6pm, (especially for drainage and pumping works in urban area); 8. Provide advance warning to the community on timing of noisy activities. Seek suggestions from community members to reduce noise annoyance, particularly related to noise sensitive activities at receptors such as periods of worship for pagodas 9. Public notification of construction operations will incorporate noise considerations; information procedure of handling complaints through the Grievance Redress Mechanism will be disseminated. 10. Ensure noise monitoring is undertaken near sensitive receptors, particularly dwellings when construction machinery is operational; 11. All construction workers will use appropriate Personal Protective Equipment (PPE) including ear defenders when operating machinery; 12. Ensure that mobile noise barriers are available for use in populated areas where excavations are taking place, if necessary, provide fencing at construction zones			
Civil Works	Flora or vegetation	13. All trees over 3m in construction sites to be protected from construction activities if they are not required to be removed. The cutting trees shall inform and get permit from DPWT and local authority. 14. An inventory shall be held of trees to be cut and addition replantation shall be sought upon completion of the work. 15. Where possible, material from existing licensed borrow and quarry sites will be used. If new sites are needed, they will be subject to due diligence and approval by ADB and the relevant PDoE to ensure that sensitive habitats are avoided and that an appropriate restoration plan using native species is agreed following re-contouring	Contractor	PIU/PMU/PMC	Included in bid price
Civil Works	Water Quality and Access	16. Provision of adequate short-term drainage away from construction sites to prevent contaminated run off entering water bodies including canals. 17. Installation of temporary storm drains or ditches for construction sites to manage and control the flow and direction of surface water run off 18. Stockpiles and materials will be stored at least 50 m from surface waters with drainage directed away from the	Contractor	PIU/PMU/PMC	Included in bid price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		irrigation canals or drainage channels and stream or water sources. 19. All construction fluids such as oils, and fuels should be stored and handled on a bund and impermeable surface; a bund will be provided around any above ground fuel storage tanks with a capacity of 110% of the largest single tank or 25 percent of the total storage capacity (whichever is greater). 20. No washing or repair of machinery within 50 m of surface waters including irrigation canals. 21. Pit latrines (for worker camps if required) to be located at least 200m from surface waters, and in areas of suitable soil profiles and above the groundwater levels. 22. Refuelling only in designated areas which are to be 50m from a water course and drip trays to be used when refuelling or topping up / changing machinery fluids. 23. Maintenance of irrigation water supplies for agriculture during dry season works within or around irrigation canals. Seek suggestions from water users if supply may be affected.			
Civil Works	Power, Water Supply, and interruption of any other town utilities	24. Based on the pre-construction assessment of power and water supply locations, if the contractor identifies a risk to supplies from construction activities, the contractor will: 25. Liaise with power or water supplier to identify an approach to minimise inconvenience to residents 26. Provide advance warning to residents (minimum 2 weeks in advance) that power/water supplies will be interrupted 27. Provide alternatives for residents if the supply interruption exceeds 2 days for water	Contractor	PMU/PMC	Included in bid price
Implementation of Materials Spoil and Borrow Site Management	Soil and land resources	28. Site specific materials, spoil and borrow site management plan will be developed and approved by the relevant Municipal authority; 29. A map of all borrow sites will be developed and maintained with copies held by the Contractor and PIU; 30. Safety measures, if required, will be implemented to prevent access by members of the public and livestock. 31. Measures to rehabilitate the borrow sites include contouring of the slopes within each site and replanting sites with native species. 32. Topsoil present on construction sites will be removed and stockpiled in a labelled area for use on rehabilitation of the site post-construction or rehabilitation of borrow sites	Contractor	PMU/ PMC	Included in bid price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		33. No disposal of spoil or dredged material on agriculturally productive land or within 50 m of a water course. 34. Construction working areas will be clearly demarcated and encroachment onto adjacent areas avoided.			
Disposal of soil and concrete materials from the removal of existing drains (Variation Order No. 3)	Flora and Fauna Soil and land resources	35. The soil excavated for the removal of existing drains shall be transported to a dedicated spoil disposal site within the premises if the WWTP but outside the fenced area (see Figure 8). Excavation of the drains shall be carried out with great care not to damage the elements and salvageable concrete elements shall be handed over to the municipality for reuse in other projects. The remaining concrete drain structures shall be separated during excavation and brought to the disposal site where the concrete shall be crushed, and rebar shall be separated for sale as scrap metal. The crushed concrete shall preferably be used for slope stabilization (including stabilization of the soil deposit slopes), or as aggregate in construction works to the extent that the materials have the required properties. Any unused crushed concrete shall be deposited together with the soil in the spoil disposal site. 36. The site boundaries shall be set out to ensure that the surrounding land is not disturbed; 37. All excess spoil materials from the removal of the existing drains shall be disposed of within the boundaries of the designated disposal site and no spoil materials may be side tipped along roads or down slopes, dumped on private or public land, or dumped in water bodies. 38. The spoil disposal site shall be prepared and made ready prior to start of the drain removal work. 39. Erosion and sediment controls shall be constructed as necessary to prevent or minimise excessive discharge of sediment-laden runoff. 40. Only inert waste is allowed to be disposed of at the spoil disposal site. 41. Roots and stumps and other vegetation debris shall be separated from the spoil materials prior to disposal and either mulched on-site for reuse in landscaping or ground stabilization works, left to decompose naturally, or otherwise safely disposed.	Contractor	PIU/PMU/PMC	Included in the cost of Variation Order No. 3

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		42. Routine inspections, not less frequently than once a week, shall be carried out of water pollution, erosion and sediment control measures, and any necessary repair or maintenance work shall promptly be implemented to ensure integrity of the design. 43. Inspections shall be undertaken within 24 hours of a heavy rainfall event. 44. Any topsoil shall be stockpiled for later site rehabilitation. 45. The site shall be recontoured, depressions will be filled, and the site shall be revegetated to create a final surface that is consistent with the original topography of the area; 46. The final landform and slopes shall be designed to prevent surface water ponding, to facilitate revegetation, to convey runoff in a non-erosive manner, and to account for long term settlement. 47. The site shall be revegetated to establish a diverse, effective, and long-lasting vegetative cover that is capable of self-regeneration without continued dependence on irrigation, soil amendments or fertilizer, and is at least equal in extent of cover to the natural vegetation of the surrounding area; 48. The site shall be revegetated with appropriate native and non-invasive plant species.			
Implementation of Solid and Liquid Waste Management	Resource use and natural resource contamination	49. Preparation of a Waste Management Plan before construction which applies the waste hierarchy to ensure efficient use and management of resources with a priority to prevent waste at source as much as possible; 50. Effective management of materials on site through good housekeeping and work planning. 51. Clear arrangements for storage and transportation of all hazardous and non-hazardous waste to an authorised and approved disposal point as set out in the CEMP Waste Management Plan. 52. The wastes, especially hazardous waste shall be collected and stored in safety tanks and provide to license sub-contractor to dispose in local license dumping site. 53. Prohibit burning of waste (anytime and anywhere). 54. Provide all vehicles/drivers with plastic bags for waste collection and prevent any unauthorized waste disposal with particular attention paid to prevention of waste entering water ways including irrigation canals.	Contractor	PIU/PMU/PMC	Included in bid price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
Management of Septage from Disconnected Households		55. The Contractor shall submit a Method Statement on septage management for review and approval by PMU/PMC (see also Para 33 and Para 34). 56. The PIU together with the Contractor shall consult with the affected households and obtain their consent to the proposed septage removal process (see also Para 35). 57. The Contractor shall inform the households/businesses at least one (1) day before any planned pumping of their septic tank. 58. The Contractor shall provide evidence of agreement with the landowner of the proposed septage disposal site. The agreement shall include the land use restrictions stipulated in Para. 59. The septage shall be disposed by land application method either by burial in trenches or pits that shall immediately be backfilled with soil, or by incorporating the septage into the soil immediately upon application. 60. To reduce odour and pathogen content, the septage shall be pre-treated with lime prior to land application. Lime shall be mixed with the septage to increase the pH of the septage to at least 12.0 for 30 minutes (2.4 to 3.0 kg per 1,000 L CaO or quicklime). The lime may be added as slurry either to the vacuum truck before the septage is pumped, or to the vacuum truck while the septage is being pumped. 61. In the event of a spill of septage, the septage shall be immediately cleaned up. Hydrated lime shall be sprinkled over the area of the spill, and the spill shall be removed - for example with a suction wand attached to the end of the vacuum hose. For large spills, a second vacuum truck may be necessary. The Contractor should reach an agreement with another company to assist in emergency spill clean-up. 62. Food crops with harvested parts that touch the septage/soil mixture and are totally aboveground shall not be harvested from the land for 14 months after application of the septage. 63. Animal feed, fibre, and those food crops whose harvested parts do not touch the soil surface shall not be harvested for 30 days after application of the septage. 64. Public access to land shall be restricted for 30 days after application of the septage. Examples of restricted access	Contractor	PIU/PMU/PMC	Included in the cost of Variation Order No. 3

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		include remoteness, posting with no trespassing signs, and simple fencing. 65. Animals shall not be allowed to graze on the land for 30 days after application of the domestic septage. 66. During the entire operation until the new wastewater system is installed and in operation, the contractor shall closely monitor and control that domestic wastewater from the affected households/enterprises does not overflow onto land or run into ditches, trenches or other voids.			
Implementation of Community and Occupational Health and Safety and Emergency Response	Human health and safety	67. Appropriate fencing, protective barriers, and buffer zones will be provided around all construction sites including barriers where needed on access roads and populated. 68. The construction campsites should be located outside and distance from residential area and fencing campsites with safety barriers and safety zones. 69. Sufficient signage giving health and safety warnings and information disclosure at all sites 70. Worker education and awareness seminars for construction hazards will be given. A construction site safety program will be developed and distributed to workers. 71. Conduct daily toolbox meetings (safety briefings) 72. An accident record book will be maintained where all major or minor accidents and incidents are recorded with actions taken. 73. Ensure that all workers are equipped with and use Personal Protective Equipment (PEE). Standard: - hard hat - high visibility clothing in yellow or orange material with reflective panels - safety shoes with metal toe cap Work specific PPE includes: - Cut-resistant work gloves - Ear protection (earplugs or muffs) wherever it is not feasible to reduce the noise levels or duration of exposures to those specified in internationally recognized guidelines - Safety glasses (rock/surface breaking, piling, crushing/grinding, cutting) - Welding hoods with clear safety glasses under (welding).	Contractor	PIU/PMU/PMC	Included in bid price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		PPE for workers handling septage or lime: - Gloves, - Waterproof safety boots, - Full overalls (or clothing that covers all exposed skin) - Safety glasses with eye shields. - Face mask 74. Develop Traffic Management Plan together with provision of safety signs, traffic safety control and regular monitoring the public safety or traffic safety management on construction sites on the streets in urban area. 75. Limited the driving speed in village/urban areas and other sensitive areas. Provide watering to reduce dust pollution in village and urban areas, when and where is dusty. 76. Each Contractor shall appoint an Environment, Health and Safety Officer who is qualified engineer. Adequate first aid equipment will be made available on site 77. Provision will be made for safety precautions when using 220 to 240 V Electric Power tools if the workers are likely to be working within wet or flooded environments. 78. Provide the training or awareness on safety management and HIV-AIDs to construction staffs, workers and local people. 79. Warning signs will be set up if mud is likely on public roads. Mud will be removed at the end of each day. Other spillages on public roads will be removed immediately. COVID-19 prevention measures: 80. Dissemination about COVID-19 prevention and mitigation measures to staff and workers through orientation or distributing leaflet/poster at information/safety board at each construction and camp site; 81. Daily checking temperature of staff and workers prior starting the works; 82. Staff and workers have to wear masks all the time and properly; 83. Do not share personal items or supplies such as phones, pens, notebooks, tools, etc.; 84. Avoid common physical greetings, such as handshakes; 85. Maintain a minimum physical distance of one metre from others if possible; 86. Wash hands often with soap and water for at least 20 seconds after using the washroom, before handling food,			

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		after blowing nose, coughing, or sneezing, and before smoking. If hands are not visibly soiled, and soap and water are unavailable, alcohol-based hand sanitizer can be used; 87. All offices and jobsites implement additional cleaning measures of common areas. All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal workstation areas are wiped down at least twice a day with a disinfectant, such as disinfectant wipes. Individuals are responsible for cleaning and disinfecting their workstations; 88. Commonly touched surfaces on vehicles and equipment are thoroughly cleaned and disinfected at the end of shifts and between users; 89. Coughing or sneezing into a tissue or the bend of your arm, not your hand; And dispose of any tissues you have used as soon as possible in a lined waste basket and wash your hands afterwards; 90. Complying with any instructions announced by Ministry of Health accordingly; 91. Responding measures if there is a COVID-19 case: 92. Individuals who have been potentially exposed to the virus, or who are exhibiting flu-like symptoms such as fever, tiredness, coughing, or congestion are instructed to: Not come to work; Contact their supervisor and/or human resources department; Stay at home and self-isolate; and contact local health authorities for further direction. 93. Such individuals are required to follow the directions of the local health authority and may not return to work until given approval by the proper health authorities; 94. Individuals who begin to display flu-like symptoms on site are instructed to avoid touching anything, take extra care to contain coughs and sneezes, and return home immediately to undergo self-isolation as directed by the local health authority; 95. All areas on site potentially infected by a confirmed or probable case are barricaded to keep individuals two meters away until the area is properly cleaned and disinfected; 96. The Emergency Response Plan will set out detailed Preventative Measures for all types of incidents covered in the Emergency Plan. This will include:			

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		97. Prevention of Injury and Accidents – to include Personal Protective Equipment requirements for construction workers, training requirements 98. Prevention of Spillage - All construction fluids such as oils, and fuels will be stored on hard standing with sealed drainage with a capacity of 110% of the largest fuel container, will include procedures on refuelling and maintaining vehicles. 99. Prevention of Fire – to include measures for Ignition Sources including prevention of smoking on construction site, management of flammable materials and liquid. 100. Other Incidents – prevention measures relevant to other issues considered relevant by the contractor 101. The Contractor will develop Emergency Response Procedures prior to construction. The procedures will cover actions to be taken in case of: 102. Worker injury (e.g. construction or traffic accident) 103. Spillage (e.g. fuel spillage) 104. Fire (e.g. fuel or chemicals storage area); and 105. Any other incidents anticipated by the contractor.			
Implementation of Construction Workers Camp Management	Contamination of water, soil, waste production and social issues	106. If a camp for construction workers is required the contractor will set out a management plan which includes a map showing camp lay out, adequate accommodation and sanitation for male and female workers, relevant training and a plan of how camp areas will be restored to original condition after construction completed. 107. If a construction camp is not required, the contractor will set out a management plan which includes: Provision of adequate waste disposal facilities, welfare facilities, and sanitation for both male and female workers 108. Priority will be given to employ local labor and retain evidence of how local labour recruitment efforts were undertaken.	Contractor	PIU/PMU/PMC	Included in bid price
Pipe Network Installation	Socio-Economic (Accessibility)	109. Warning given to residents 4 weeks in advance of any excavations 110. Implement traffic management procedures to ensure smooth traffic. Provide traffic signs, control vehicle speeds and be able to warn drivers in advance for any changes to road surface or traffic direction 111. Provide adequate and safe pedestrian and vehicular (motorbike) access to enter and exit buildings across any open trenches	Contractor	PIU/PMU, PMC	Included in bid price

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		112. Temporary restoring/rebuilding the impacted assets or relocation of shops and stalls through cooperation, between construction contractor, HHs and PIU 113. Define and adjust suitable working hours in urban areas or at sensitive sites. Open access road for entry and exit for business sites. Remove the unsuitable soil and materials (spoils) from construction sites which are in front of houses and shops 114. Restoration or compensation of any damage to properties at an expense of the contractor 115. Consideration and management of potential localized flood impacts.			
PMC-I/NES	Project Completion	116. Site visit in order to develop Project Completion Report to assess community views on project and EMP implementation overall and state of project at contractor's handover	PMC-NIES	PMU	Part of Contract Cost
Operation Phase					
Operation of WWTP	Surface Water	1. Final design ensures that the effluent will meet the criteria in Sub-decree, No. 27 ANRK.BK on Water Pollution Control, MoE, 1999 (ic water area and sewer). 2. Final design considers climate change and provides dike around the WWTP site to protect the WWTP against flooding. 3. Always comply with the required operation and maintenance standards (i.e. Surface Water Quality Standard Referring to Sub-Decree No. 27 ANRK.BK) to ensure effluents are treated effectively prior to discharge. 4. Provision of adequate budget for O&M of WWTP 5. Regularly inspect the sewage system structures and provide maintenance or corrective actions 6. Conduct monitoring and reporting on water quality of receiving water after discharge from WWTP. The discharge of wastewater quality from WWTP shall always comply with discharged standards specified in Sub-Decree No. 27 ANRK.BK). Inform downstream users of the risks to their health of using water for consumption.	Operator Team	MPWT MoE	Included in operational costs
Operation of WWTP	Odour and Dust (wastewater treatment).	7. Regular inspect and maintenance the operation of WWTP, culvert system, and pumping stations. 8. Removing screenings and grit from the inlet and outlet works;	Operator Team	MPWT MoE	Included in operational costs – O&M Budget

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
		9. Cutting grasses on the embankment, and removing it so that it does not fall in the ponds; 10. Removing floating scum and floating macrophytes from the surface of the maturation and facultative ponds. This will be done to maximise the light energy reaching the pond algae, increase surface re-aeration, and prevent fly and mosquito breeding; 11. Spraying scum on the surface of the anaerobic ponds and not removing it, since this will help the treatment processes; 12. Removing any accumulated solids in the inlet and outlet works; 13. Repairing any damaged embankment as soon as possible; and 14. Repairing any damage of the fences or gates. 15. Transport of any sludge materials off site on days of low wind speed; 16. Washing/cleaning wheels of vehicles before leaving the site to remove mud or dirt to control dust dispersion to nearby houses 17. Use quick-disconnect fittings between septage pumper truck and receiving station to minimize exposure of septage to the atmosphere 18. Wash-down septage facilities to clean up any spills, with drainage into the septage chamber 19. Avoid free fall of septage by extending receiving pipes below the water surface 20. Introduce septage at slow controlled rates to avoid turbulence or agitation 21. Ventilate the air from the septage chamber to an odour biofilter 22. Clean tanks, trucks and equipment daily 23. Provide Tree plantings (tree screen) and green place inside and around the WWTP sites to reduce dust and odours; 24. Fully cover sludge loading trucks during transport for disposal 25. Provision of adequate budget for O&M 26. Conduct air quality monitoring inside and near the WWTP. The air quality shall be complied with national standards of Sub-decree on Air Pollution and Noise Disturbance 2000. 27. Quarterly meetings between WWTP operator, DPWT and nearby residents and / or their representatives to identify odour or nuisance issues and corrective actions.			

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
Operation of Sewerage Network	Odour nuisance Community and Occupational Health and safety	28. Community outreach initiatives, such as consultations, meetings and information campaigns regarding contact with wastewater. 29. Preparation of an operations manual for combined sewers and WWTP, which shall include an occupational health and safety plan (OHSP) 30. Monitor the pumping stations for possible release of offensive odour, and if necessary, install ventilation stacks with odour filter treatment (carbon filters, biofilter). 31. Conduct routine hosing and debris removal at the pumping station wet wells to remove accumulated solids. 32. Plan and execute work in compliance with country-specific COVID-19 risk management regulations and directives including directions of the General Department of Labour, MoLVT. 33. Conduct workplace risk assessment to identify low, medium or high exposure risk to COVID-19. Prepare an action plan for prevention and mitigation of the spreading of COVID-19. 34. Conduct Risk communication, training, and education. Training of workers in infection prevention and control practices 35. Adopt engineering, organizational and administrative measures, plan work so employees can keep distance from each other and minimize contact. 36. Provide clear and visible guidelines on how to prevent infection at the construction site and initiatives taken. 37. Regularly clean and disinfect toilet and bathrooms 38. Promote personal hygiene (including hand and respiratory hygiene), make wash basins and sanitizers available 39. Screen on entry the temperature of each person entering the work site and record their contact details to facilitate tracking of infected persons should there be a need 40. Provide personal protective equipment (PPE) and inform workers of its correct use. 41. Health surveillance and insurance 42. Consider other hazards, including psychosocial 43. Review emergency preparedness plans 44. Review and update preventive and control measures as the situation evolves. Involve workers/OHS groups in the review.	Operator Team	MPWT/ MoE	Included in operational costs – O&M Budget

Subproject Activity	Environmental Impact / Issue	Mitigation measures	Implement by	Supervise by	Cost (\$)
Operation of WWTP	Land and surface water pollution, occupational H&S	45. As part of O&M manual provide clear methods and procedures for all aspects of the WWTP and pump station operation, including the following key issues ³ : 46. Sludge management including treatment, disposal and emergency situations 47. Monitoring/ testing procedures and schedule for treated effluent and sludge, with approval by MOE. Work with MOE and MPWT to establish biosolids reuse quality requirements. 48. Emergency procedures including schedule for testing and upgrading procedures 49. Procedures for storing, transporting and disposing of solid waste generated by the operations	Operator	PDPW and MPWT	Included in operational costs – O&M budget
Effluent Discharge	Agricultural Yield Impact	50. Provision of effluent analysis to the Provincial Department of Agriculture on a regular basis 51. Regular monitoring the operation system of discharging of treated wastewater effluent into the canal. 52. Collaborate with MOE/PDoE to conduct monitoring of wastewater discharging quality from WWTP and surface water quality in stream or irrigated canal. The discharging wastewater quality shall always comply with national standards of Sub-Decree No. 27 ANRK.BK). 53. In collaboration with the Provincial Department of Agriculture carry out microbiological analyses of effluents to determine if the effluent can be used for unrestricted irrigation and aquaculture.	Operator Team	PDAFF/ MoE	Included in operational costs – O&M Budget

³ The Contractor may refer the applicable WB Group EHS Guidelines for WWTP operation, which are available at: www.ifc.org/ehsguidelines - The <https://www.ifc.org/wps/wcm/connect/0d8cb86a-9120-4e37-98f7-cfb1a941f235/Final%2B-%2BWater%2BAnd%2BSanitation.pdf?MOD=AJPERES&CVID=jkD216C>

5. MONITORING PLAN

36. The project monitoring is conducted under the EMP includes:

- (i) **Project readiness monitoring.** Monitoring to check progress on project readiness and close gaps through corrective actions.
- (ii) **Environmental quality monitoring.** To be conducted by a competent authority or person appointed by the Contractor, involving the collection and analyses of air quality, noise and water quality data at designated monitoring locations for assessing compliance with applicable environmental quality and emission standards during construction.
- (iii) **EMP compliance monitoring.** To be conducted by the PMC-NES (contracted via the Project Management Consultants) to verify EMP compliance during project implementation.
- (iv) **Affected People monitoring (consultation).** To be conducted by the PIU-SFP via consulting affected people on the impacts during construction.
- (v) **Operational monitoring.** This is required as part of the operations of the subproject and will be undertaken by the relevant government department or a nominated private sector operator.

37. The engagement of a National Environmental Specialist for 10 months will be critical to ensuring the capacity of the PIU staff and to ensuring monitoring is effective and that corrective actions are promptly identified and implemented.

5.1. Project Readiness Monitoring for Subproject

38. Before construction, the PMC will monitor the project's readiness on environmental management based on a set of indicators in **Table 7** below and report it to ADB and PMU. This assessment will formally demonstrate that environmental commitments are being carried out and environmental management systems are in place before construction starts or suggest corrective actions to ensure that all requirements are met.

Table 7: Project Readiness Assessment Indicators

Indicator	Criteria	Are the Criteria met?	If No, What Corrective action is needed?	Date for Corrective Action Completion
		Yes/No		
1. EMP update	EMP updated after detailed design & cleared by ADB	Y/N		
2. Compliance with loan covenants	The borrower complies with loan covenants related to project design and environmental management	Y/N		
3. Public involvement effectiveness	Meaningful consultation completed	Y/N		
	GRM established with entry points	Y/N		
4. Environmental supervision and monitoring in place	Recruitment of external staff as set out in the Institutional Arrangements for this EMP	Y/N		
	Nomination of government staff for PMU and PIU roles as set out in the Institutional Arrangements for this EMP	Y/N		

Indicator	Criteria	Are the Criteria met?	If No, What Corrective action is needed?	Date for Corrective Action Completion
		Yes/No		
5. Bidding documents and contracts with environmental safeguards	Bidding documents and contracts incorporate the environmental activities and mitigation measures required by this EMP	Y/N		
	Bidding documents and contracts incorporate the Particular Conditions for bidding (see Annex 3)	Y/N		
6. EMP financial support	The required funds have been set aside for EMP implementation including training and capacity building	Y/N		

5.2. Environmental Quality Monitoring

39. During construction, the impact on the sensitive environmental receptors will be monitored and compared against the relevant national environmental standards.

40. During operation, the PIU and relevant operators will be expected to maintain an adequate budget to ensure environmental monitoring can be undertaken as specified in **Table 8**.

5.3. EMP Compliance Monitoring

41. In order for the EMP to be effective, all its mitigation measures must be monitored to ensure they are implemented. Note this applies to construction only; during operation, it is the responsibility of the appropriate ministries or its line departments to ensure monitoring of operational facilities is incorporated in the operations and maintenance manual and carried out routinely. Compliance monitoring requirements are summarized in **Table 9**.

5.4. Environmental Policy and Standards

42. The construction and operation phases of the projects shall follow relevant environmental quality standards. These are presented in

43. **Annex 44** for reference. These quality standards relate to i) air quality, ii) ambient surface water quality, iii) groundwater quality, vi) soil quality, v) effluent quality.

Table 8: Environmental Quality Monitoring for WWTP Subproject

Environmental Indicators	Location	Method & Frequency	Responsibility		Estimated Costs (USD)	
			Supervision	Implementation	Per Sample	Total per site/yr
Construction Phase – WWTP						
Air Quality -including PM10, CO2, NO2, SOx	Nearest residential receptor (2 locations) WWTP site (x:485052; Y: 2403283)	1 day (24-hr) per 3 months Means in accordance with national standard	CSC/PIU	Contractor	\$1000	\$8000
Noise	Nearest residential receptor (2 locations) WWTP site (x:485052; Y: 2403283)	1 day (daytime only) per 3 months Means in accordance with national standard	CSC/PIU	Contractor	\$300	\$3600
Water Quality	Upstream and downstream SWQ1: (X: 488413, Y: 1405335) SWQ2: (X:487079, Y:1405387)	Every 3 months during construction periods Means in accordance with national standard	CSC/PIU	Contractor	\$100	\$800
Operations Phase – WWTP						
Treatment monitoring: Inlet and outlet flow rates, pH, DO, BOD5, COD, total N, total P, TSS, TDS, faecal coliform bacteria	Each step in the treatment process	Weekly during the first 6 months of operations, thereafter monthly or more often in case of performance problems	PIU	Operator	Included in operational costs – O&M Budget	
Effluent Quality Parameters: pH, Colour, Odour, TSS, TDS, DO, BOD5, COD, total P, total N, NH3-N, Fe, Cu, Pb, Cd, Zn, Oil and Grease, E.coli, Coliform	Effluent outfall	Twice per year or in case of complaints	MoE MPWT	Operator	Included in operational costs – O&M Budget	
Effluent Quality Parameters: pH, DO, BOD5, COD, NH3-N, TSS, TDS, faecal coliform bacteria	Effluent outfall	Monthly	MoE MPWT	Operator	Included in operational costs – O&M Budget	

Environmental Indicators	Location	Method & Frequency	Responsibility		Estimated Costs (USD)	
			Supervision	Implementation	Per Sample	Total per site/yr
Microbiological irrigation water quality parameters	Effluent outfall	Prior to determining if effluents are allowed for unrestricted use in irrigation and aquaculture. Thereafter as required by the competent authority	Ministry of Agriculture and Forestry	Operator	Included in operational costs – O&M Budget	
Odour	Site boundary (downwind) Pumping stations	Odour boundary monitoring method to be established within Operational Plan	MoE MPWT	Operator	Included in operational costs – O&M Budget	
Receiving Water Body pH, Colour, Odour, SS, BOD5, COD, total P, N total, Fe, Cu, Pb, Cd, Zn, Oil and Grease, E.coli, Coliform	Stueng Saen River Upstream and downstream SWQ1: (12°41'54.88"N 104°51'10.87"E) SWQ2: (12°41'49.58"N 104°50'45.74"E) See Figure 96	Quarterly and every time effluent quality failure is recorded	MoE MPWT	Operator	Included in operational costs – O&M Budget	
Worker & public injury associated with WWTP operations	On property of WWTP	Regular record keeping	MPWT Ministry of Labor and Vocational Training (MLVT)	Operator	Included in operational costs – O&M Budget	

Figure 9 Surface Water Quality Monitoring Stations

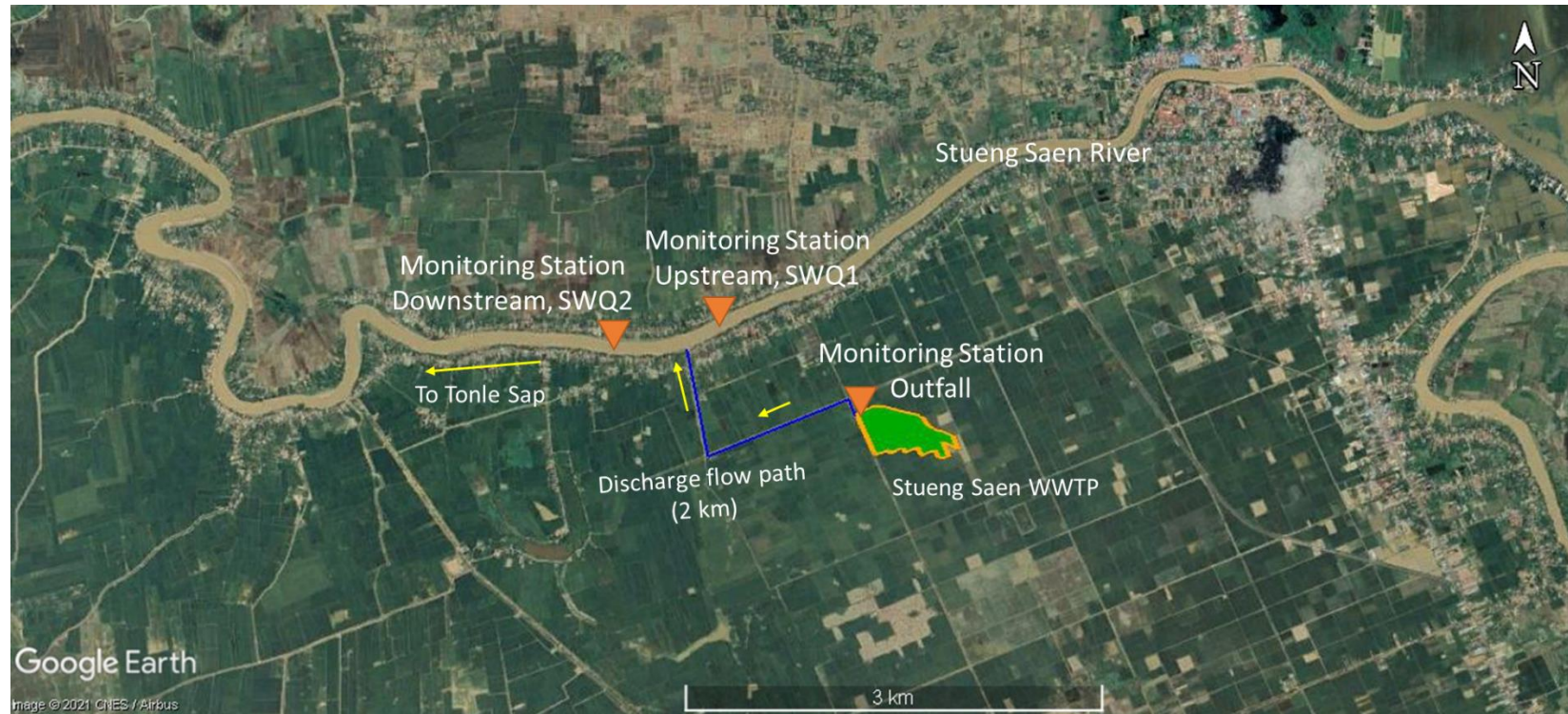


Table 9: EMP Compliance Monitoring

Environmental Indicators	Location	Method & Frequency	Responsibility		Estimated Costs (USD)
			Verification	Implementation	
Construction Phase – WWTP Subproject					
Air Quality	Civil works sites	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract
Noise	Civil works sites	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract
Flora	Civil works sites	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract
Water Quality	Civil works sites	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract
Soil and land resources	Quarries, Borrow and Spoil Disposal Sites	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract
Resource use and natural resource contamination	Implementation site of Solid and Liquid Waste Management Sub-Plan B	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract
Human health and safety	Implementation of Community and Occupational Health and Safety and Emergency Response Sub-Plan C as well as COVID-19 prevention and mitigation measures	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC/Contractor H&S engineer	Included in CSC contract
Contamination of water, soil, waste production and social issues	Implementation of Construction Workers Management Sub-Plan D	Monthly checking against mitigation measures specified in this EMP	PMC-NES	CSC	Included in CSC contract

Environmental Indicators	Location	Method & Frequency	Responsibility		Estimated Costs (USD)
			Verification	Implementation	
Community Issues • Environmental impacts of civil works (e.g., solid & liquid waste, erosion, local flooding, pollution). • Any unforeseen impacts caused by accidentally e.g. through spillages • Civil nuisance (e.g., noise, disrupted business & farming activity, social issues, community health and safety). • Impaired use of access roads (e.g. traffic issues and access). • GRM and its procedures & key contacts	At all construction locations	Consultation interview with Affected People Using the form in Annex 1 4-6 weeks after construction starts Every 2 months until end of construction	PMU-ESO	PIU-SFP	Included in PIU staff/travel budget
Socio-Economic (accessibility)	All sites of pipe excavations in urban areas	4-6 weeks after construction starts Every 2 months until end of construction	PMU-ESO	PIU-SFP	Included in PIU staff/travel budget

6. PUBLIC CONSULTATION

44. The IEE for this subproject contains details of the consultation undertaken during preparation of the subproject. In addition, consultations will take place during implementation. The PIU Safeguard Focal Point (PIU-SFP) will undertake consultations after detailed design are completed and will conduct consultations within 4-6 weeks of construction starting and then again, every 3 months until the end of construction.

45. Informal monitoring interviews with affected people will focus on complaints about community disturbance from construction activities, such as construction noise, dust, odour, solid waste and wastewater, as well as public concerns about ecological protection, soil / land concerns and access issues. A sample Environmental Monitoring Interview Form is given in Annex 1. This will contribute to project monitoring.

7. GRIEVANCE REDRESS MECHANISM

7.1. GRM Objective

46. A grievance redress mechanism (GRM), consistent with the requirements of the ADB Safeguard Policy Statement (2009) will be established to prevent and address community concerns, reduce risks, and assist the project to maximize environmental and social benefits. In addition to serving as a platform to resolve grievances, the GRM has been designed to help achieve the following objectives: (i) open channels for effective communication, including the identification of new environmental issues of concern arising from the project; (ii) demonstrate concerns about community members and their environmental well-being; and (iii) prevent and mitigate any adverse environmental impacts on communities caused by project implementation and operations. The GRM is accessible to all members of the community.

7.2. Proposed GRM System

47. In Cambodia, there is currently no existing legally established system to resolve environmental concerns and complaints. The MPWT, as the EA of the Tonle Sap II will establish the GRM. The setup shall be made before commencement of site works and have members from the PMU, district authority and commune councils. Grievances can be filed in writing or verbally with any entry point of the GRM. The committee will have 15 days to respond with a resolution. The PMU's Environment Safeguards Officer (PMU-ESO) will oversee the implementation/observance of the mechanism and will be responsible for keeping the PMU informed. The PIU Safeguards Focal Point (PIU-SFP) will be responsible for ensuring GRM implementation at the subproject level.

48. The GRM will accommodate both informally and formally lodged eligible, grievances. Informally lodged grievances are those received by the contractor during construction. Formally lodged grievances are those received at District and Commune Council offices or direct to the PIU. Commune Councils evaluate complaints for eligibility and then report to PDPWT. The PDPWT and PMU maintain record of all grievances, informally and formally lodged, eligible and ineligible. The PMU will inform the MPWT, as necessary, and report on the observance/implementation of the GRM in the monthly progress reports and in the periodic Environmental Monitoring Report that will be submitted to the MPWT.

7.2.1. Access to the Mechanism

49. Any person who has environmental issues pertaining to the subproject during detailed design, construction and operation phases will have access to the mechanism free of charge. The PMU, through its Environment Safeguards Officer (PMU-ESO) and staff in the MPWT, will ensure that:

- (i) The public and all stakeholders are aware of their rights to access, and will have access to, the GRM free of administrative and legal charges; and
- (ii) The GRM is fully disclosed prior to construction: (a) in public consultations, (b) through posters displayed in the commune office (posters to include names and contact details of the PIU-SFP)

50. The Access Points to the GRM are critical for ensuring it is useable for affected people (APs). The GRM Access points for this project, as set out in this GRM Mechanism will be:

- The Contractors
- District and Commune Councils
- The PIU office
- The Provincial Department of Public Works and Transport (PDWT).

7.2.2. GRM Steps and Timeframe

51. Grievances raised on environmental impacts are critical to the health and safety of APs. Hence, the proposed mechanism intends to be easily accessible and promptly responsive to APs' complaints.

7.2.3. Informal Approach

52. Informally, APs can lodge complaints directly to the contractor during construction. PMU to provide contractor with GRM contact details which the contractor will use to print 'GRM Contact Cards' for its staff to hand to complainants and will keep cards with all vehicles, machinery and site managers/foremen.

53. Contractor to raise awareness of all workers on how to respond when an AP or member of the public has a complaint i.e. direct the person to the most senior site manager present at the time and/or Contractor GRM focal point and prepare a 'GRM Contact Card'.

54. The contractor shall document and assess the complaint immediately. If assessment validates the complaint as within the scope of the GRM/eligible, the contractor shall act on the complaint within three days from receipt of complaint. MPWT shall obtain a written confirmation of satisfaction from the AP after 7 days from completion of resolution by the contractor

55. If assessment invalidates the complaint (i.e., reveals the complaint as ineligible or not associated with the project's environmental performance), the contractor shall direct the AP to the Commune Council and shall report the complaint to MPWT within 2 days from receipt of complaint, stating reasons for ineligibility.

7.2.4. Formal Approach

56. If complaint is eligible but is not acted on within three days from receipt of complaint, or if AP is not satisfied with the resolution undertaken by the contractor, he/she can access the formal mechanism, as shown in **Table 10**.

Table 10: GRM Steps

Step	Action
Step 1: Lodging a Complaint (Day 1)	AP lodges complaint, by him/herself or with assistance from the village chief or district council, at the access point with the Commune Council. The complaint may also be lodged with the PIU or PDPWT,
Step 2: Documentation & Registration of Complaint (Day 1)	Commune Council, PIU/PMU or PDPWT documents/registers lodged complaint, makes sure these are referenced and provides AP with a copy of referenced complaint. The commune forwards complaint document to the MPWT. A copy of a proposed GRM Complaint Form is in Annex 3.
Step 3: Assessment and Discussion (Day 1 to 3)	AP shall be informed if the grievance is eligible or ineligible. If it is ineligible, AP shall be directed to the district. If complaint is eligible, AP shall be informed of the expected action timelines as set out in the established mechanism If both of the AP and contractor/operator are available, the complaint shall be immediately reviewed, investigated and discussed. If not, both parties should agree to undertake the review, investigation and discussion within 3 days. The discussion will centre on the cause and action/measure to implement and will engage the PIU/PMU. After review and investigation, agreement on actions and measures and time involved shall be made with the AP. Agreement shall be properly

Step	Action
	documented and filed; MPWT, PIU/PMU, Commune Council and AP shall have copies
Step 4: Implementing the Agreed Resolution	(Day 3 to Day 4) If complaint is minor, i.e., not requiring further investigation and would be easy to resolve, the contractor/operator shall immediately implement agreed on action/resolution. (To be implemented by Day 8) If further investigation and/or procurement of supplies/parts would be necessary, the contractor/operator shall: (i) immediately provide the most suitable interim measure to reduce the magnitude of the impact; and (ii) start work on the final measure within 15 days from the day the complaint is lodged.
Step 5: Acceptance of Resolution (1 week after completion of action/measure taken)	If, according to the AP, the impact has been resolved satisfactorily, MPWT shall obtain a written confirmation of satisfaction from the AP. This confirmation will signify closure of grievance and will form part of the grievance documentation. The PIU, Commune Council and AP shall retain their copies of the confirmation.
Step 6: Monitoring and Evaluation (for 1 week after closure of grievance)	The MPWT shall monitor the effectiveness of the resolution for at least a week after closure of grievance (that is, when action implemented has been satisfactorily confirmed in writing by the complainant). Monitoring and evaluation shall be properly documented and included in the Environmental Monitoring Report.
Step 7: Appeal for Dissatisfied AP	When dissatisfied (or, in the event the issue/impact persists despite actions undertaken), AP can appeal for assistance from the district in the elevation of his/her complaint to the provincial authority. The provincial authority shall call all parties concerned to review the history of the grievance and resolution process taken and assess the validity of the appeal.

57. **Appeals.** If appeal is found not valid, the provincial authority shall write the AP and declare the grievance closed. In the event of an appeal, the MPWT shall immediately report to the PMU. The PMU shall ensure that the ADB is immediately informed.

58. If appeal is assessed to be valid, provincial authority and the parties discuss and agree on the quick resolution of the issue. The PMU requires the contractor and operator to implement the agreed resolution. Should the issue continue to persist despite the second action, or the AP remain dissatisfied, the following steps will be taken:

59. **Special Mission or Judicial System.** If the complainant is still unsatisfied, the PMU/EA will inform ADB to convene a special mission to attempt a resolution prior to use of the Cambodian judicial system.

60. **Accountability Mechanism of the ADB.** In addition, affected people may always contact the Complaints Receiving Officer of the ADB via the following addresses which will be included in the subproject signboard:

Complaints Receiving Officer, Accountability Mechanism
Asian Development Bank
ADB Headquarters, 6 ADB Avenue, Mandaluyong City 1550, Metro Manila, Philippines
(+632) 632-4444 loc. 70309
(+632) 636 2086

61. Instructions available here: <http://www.adb.org/site/accountability-mechanism/how-file-complaint>.

62. Sufficient communication on the GRM including signs containing contact details of the GRM access points will be displayed at strategic locations to sustain the effective implementation of the mechanism.

7.2.5. GRM – Stueng Saen

63. A Provincial Grievance Redress Committees (PGRC) has been established in Stueng Saen (PGRC with reference letter 1051/19 SSR and PRSC with reference letter 070/19 SSR dated on 28 February 2019.). The contact details of each level of GRM are:

(i) Commune Grievance Redress Committee

Sangkat Kampong Roteh

Name: Leang Chuon

Tel: 017 366 028

Sangkat Dmorei Choan Khla

Name: Heng Sochenda

Tel: 011 889 222

Sangkat Kampong Thom

Name: Trork Luem

Tel: 092 907 355

Sangkat Oukunthou

Name: Chiv Kem Un

Tel: 012 214 628

Sangkat Trapaeng Russey

Name: Uk Vannary

Tel: 092 911 664

(ii) District Grievance Redress Committee

Stueng Saen

Name: Mak Bunhong

Tel: 012 637 437

Kampong Svay

Name: Un Buth

Tel: 012 853 585

(iii) Provincial Grievance Redress Committee

Name: Excellency, Sok Lou

Position: Provincial governor

Tel: 012 658 668

8. REPORTING

64. Environmental monitoring reports (using ADB's integrated safeguards monitoring report format) will be prepared semi-annually for the EA by the PMC in collaboration with PMU-ESO and sent to the MoE and ADB. The reports will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators and will include relevant national environmental quality standards. **Table 11** gives reporting requirements.

Table 11: Reporting Requirements

Report	Frequency	Purpose	From	To
Contractors' Progress Report	Monthly	EMP Implementation Progress and Monitoring Results	Contractor	PMU
Project Progress Report	Monthly	Confirm Mitigation Measures	International National Env Specialists with PIU-SFP	PMU
Project Progress Report	Quarterly	Progress of environmental safeguards implementation	PMC to PMU for review	ADB
Environmental Monitoring Report	Semi-Annual	Full EMP Implementation and Adherence to Environmental Covenants/Conditions	PMC for PMU	ADB
WWTP Operation	Quarterly	Surface and groundwater Quality. Effluent quality, sludge disposal, health and safety	Operator	EA

8.1. Mechanisms for Feedback and Adjustment

65. Based on environmental monitoring and reporting systems in place, the PMU shall assess whether further mitigation measures are required as corrective action, or improvement in environmental management practices are required. The effectiveness of mitigation measures and monitoring plans will be evaluated by a feedback reporting system. The PMU will play a critical role in the feedback and adjustment mechanism. If the PMU identifies a substantial deviation from the EMP, or if any changes are made to the project scope that may cause significant adverse environmental impacts or increase the number of affected people, then the PMU shall immediately consult MoE, MPWT and ADB to get approval and identify EMP adjustment requirements.

9. ESTIMATED COST OF EMP

66. The total cost for EMP implementation for the WWTP comprises the following:

- Mitigation measures (in table 5, 7, and 8) Costs to be included in construction contract and operations budget
- Environmental quality monitoring (Table 7) \$12,400 per year
- EMP Compliance Monitoring (including public consultation) (Table 8) No additional cost

67. Excluded from the EMP budget as separate items are

- Measures required as part of good construction practice. This includes provision of PPE for workers working at site. Cost estimate for such provision for 100 workers are as follow
 - Hard hat (@ 3 USD) 300 USD
 - Glove (@ 0.25USD) 25USD for 10 units/person/year =250 USD/year
 - Mask (50 pcs) @7 USD for 20 units/person/year=280 USD/year
 - Ear plug @1 USD for 5 units/person/year= 500USD
 - Safety Glass @ 1.5 USD for 5 units/person/year =750 USD/year
 - Boot @ 13 USD for 2 pairs/person/year =2600 USD/yearTotal= 4680 USD/year with 15% contingency then= 5382 USD/year
The annual machinery maintenance cost is, in general, 10 % of machinery cost while mobile noise barriers can be custom designed and built on site for temporary use.
- Remuneration and associated costs for Project management consultants and staff within PMU and PIU as this is covered elsewhere in the project budget.
- Cost for Project Management Consultant which includes a National and International Environmental Safeguards specialist.
- Training covered elsewhere including landfill and WWTP operator training which is covered under the feasibility study for each specific subproject.

68. Contractors will bear the costs for all mitigation measures during construction, including those specified in the tender and contract documents as well as those to mitigate unforeseen impacts due to their construction activities.

69. The selected operators, private sector or government, will bear all environmental monitoring and reporting costs during the operational stage. EMP operational environmental mitigation and monitoring measures will be incorporated in the operations and maintenance manual

10. CONCLUSION

70. The EMP, if implemented as directed, will mitigate impacts on the natural environment and affected people to an acceptable level. The key parties for mitigation measure implementation are the construction contractors and the operators. The implementation of this EMP will be closely monitored and reported by the relevant stakeholders in the project.

71. The most significant impacts from the project will arise from facility operation, for the WWTP subproject is more concerning during operation stage and the sewerage system more consider during construction for installation the sewage pipes in the town. As a result, there is a comprehensive training and capacity building component to the project which is essential for ensuring the investment is both financially and environmentally sustainable and beneficial

72. A robust Grievance Redress Mechanism will be established, as outlined in this EMP. It will ensure that all unplanned impacts which cause grievances for affected people are managed swiftly and a satisfactory outcome brought about.

73. Overall, the project is anticipated to bring environmental benefits to the populations of the project cities. It will serve to improve the current sewage and waste management situation and will provide long term environmental improvements.

Annex 1: Affected Person Monitoring Form

Consultation / Interview Form

Date of Interview		Interviewer Name	
Interview Site: Where is the interview held? In school, on the road, in shop		Stakeholder Name & Status: Full name, status is business owner, school teacher, religious leader, resident	
Construction Site & Date Construction Started Which road, GPS location if available		Has this stakeholder been interviewed before? Yes (when were they interviewed) No	

Interview Discussion Points:

1. NOISE	Record of Discussion
Before the project started, was the person disturbed by noise? If yes, explain how and when. Where did the noise come from? E.g. traffic, machinery, people, music When did it disturb the person? E.g. all day, at night, intermittently	
During the construction, is the person disturbed by noise from the project? If yes, explain how and when. What type of noise and where did the noise come from? All day, at night, intermittently?	
If noise from construction is a problem, what changes does the person suggest are made?	

2. AIR QUALITY	Record of Discussion
Before the project started, was the person affected by air pollution or dust? If yes, explain how and when. Where did the pollution or dust come from? E.g. traffic, machinery, construction, burning garbage, cooking stoves When was the dust or pollution a problem? E.g. all day, at night, intermittently	
During the project, is the person disturbed by dust or pollution? If yes, explain how and when. What type of noise and where did the noise come from? E.g. increased traffic congestion, construction machinery, construction workers, burning construction garbage etc When did it disturb the person? E.g. all day, at night, intermittently.	
3. VEGETATION AND LAND USE	Record of Discussion
Before the project started, what was the vegetation like in the project area? E.g. pasture land, trees, shrubs, rice fields.	
During the project, has the person found the vegetation situation has changed? If yes, explain how and when.	
If impact on vegetation is unacceptable, what changes does the person suggest are made?	
4 COMMUNITY SAFETY	Record of Discussion
Before the project started, can you describe the community safety situation in the project area? E.g. no problems, some accidents, difficulty crossing the roads	
During the project, has the person found the community safety situation has changed? If yes, explain how and when. Slower traffic so easier to cross the roads, construction vehicles are making a crossing harder / easier, more accidents / less accidents, construction site dangers	
If change in road safety is unacceptable, what changes does the person suggest are made?	
5. WATER QUALITY	Record of Discussion
Before the project started, was the person affected by poor water quality? If yes, explain how and when. Ground water? Surface Water? which Water source? How was it polluted?	
During the project, is the person affected by water pollution? If yes, explain how and when. Ground water? Surface Water? which Water source? How is quality being affected?	
If water quality from the construction is a problem, what changes does the person suggest are made?	
6. ACCESS	Record of Discussion

During the project, is the person affected by reduced access to their business, home or land? Access to what is limited, and how?	
If access limitations are not acceptable, please suggest changes which can be made?	
7. OTHER ISSUES	Record of Discussion
Any other issues about the construction sites that the person wants to discuss? E.g. wastewater concerns, waste disposal, Other concerns, labour force,	

Annex 2: GRM – Complaint Recording Form

PIU Staff Responsible: (name and role)	
Date: (of this record)	
Date of Complaint:	
Date Resolution Required by (15 days from initial complaint):	
Complaint Made by: (Name & Contact Details)	
Method of Complaint: (direct to PMU, via Contractor, Via Commune People's Council)	
Details of Complaint: (issues, actions taken so far, when did it start – all details needed)	
PMU Actions: (Next steps for PMU to resolve the issue or to move complaint to next level)	

Follow Up Actions Needed and Date: (PMU to follow up on resolution if needed, e.g. check contractor actions)	
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Annex 3: Particular Conditions (for Bidding Documents)

74. The following clauses shall be added to the Bidding Document, Section 8 Particular Conditions in relation to the Environmental Safeguards for the Project:
75. The contractor will undertake to develop and submit to the PMU/CSC for approval, a site-specific Construction Environmental Management Plan with the following management sub-plans:
- A. Spoil and Borrow Site Management;
 - B. Solid and Liquid Waste Management;
 - C. Community and Occupational Health and Safety and Emergency Response;
 - D. Construction Workers' Camp Management (if required).
76. The management sub-plans will be sufficiently detailed as to allow a clear understanding of the approach the contractor will take to mitigate environmental impacts during construction. The contractor will adhere to the management sub-plans at all times unless prior agreement has been given by the PMU under extenuating circumstances.
77. The Contractor will commit to ensuring a full time environmental health and safety officer on site who is competent, nominated to manage health and safety risks, and who can implement the EMP requirements for occupational health and safety and ensure relevant health and safety legislation is followed.
78. The Contractor will commit to enabling the project staff or consultants tasked with monitoring, full access to all information and data required in order that the Environmental Management Plan can be fully monitored.

Annex 4: Environmental Quality Standards

(1) Ambient Air Quality Standards

Source: Sub-decree **No. 42 ANRK.BK** on Air Pollution Control and Noise Disturbance, MoE 2000 and WHO. Ambient Air Quality Guidelines (2005).

Parameter		No. 42 ANRK.BK	WHO Ambient Air Quality Guidelines (2005)
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	Averaging Period	Unit	Value	Averaging Period	Value / Unit
Nitrogen Dioxide (NO ₂)	24 hours	mg /m ³	0.1	1 hour	200 µg/m ³
Sulfur Dioxide (SO ₂)	24 hours	mg /m ³	0.3	1 hour	20 µg/m ³
Carbon Monoxide (CO)	24 hours	mg /m ³	20		
PM 2.5	24 hours	-	-	24 h	25 µg/m ³
PM 10	24 hours	-	-	24 h	50 µg/m ³

(2) Ambient Noise Standards

Source: Sub-decree **No. 42 ANRK.BK** on Air Pollution Control and Noise Disturbance, MoE , 2000 and WHO Community Noise Guidelines (1999).

Time Period (24 hours)	No. 42 ANRK.BK	Areas Specified for WHO Guidance	WHO Community Noise Guidelines (1999)
	Value / Unit		Value / Unit
Day time (from 6:00am to 6:00pm)	70.0 dB(A)	Outdoor Living Area - serious annoyance - moderate annoyance	55 dB(A) 50 dB(A)
Evening Time (from 6:00pm to 11:00pm)	65.0 dB(A)	Inside dwellings - moderate annoyance	35 dB(A)
Night time (from 11:00pm to 6:00am)	50.0 dB(A)	Inside dwellings - sleep disturbance	30 dB(A)

(3) Surface Water Quality Standard

Referring to Sub-Decree **No. 27 ANRK.BK** on Water Pollution Control, MoE, 1999, the standards of water quality are divided as follows (this decree applies to effluent discharge from WWTP):

Annex 2 of Sub-decree on Water Pollution Control

Effluent standards applicable to the Subproject are those for discharging to public water area and sewer

No	Parameters	Unit	Allowable limits for pollutant substance discharging to	
			Protected public water area	Public water area and sewer
1	Temperature	0C	< 45	< 45
2	pH		6 – 9	5 - 9
3	BOD5 (5 days at 200 C)	mg/l	< 30	< 80

No	Parameters	Unit	Allowable limits for pollutant substance discharging to	
			Protected public water area	Public water area and sewer
4	COD	mg/l	< 50	< 100
5	Total Suspended Solids	mg/l	< 60	< 120
6	Total Dissolved Solids	mg/l	< 1000	< 2000
7	Grease and Oil	mg/l	< 5.0	< 15
8	Detergents	mg/l	< 5.0	< 15
9	Phenols	mg/l	< 0.1	< 1.2
10	Nitrate (NO ₃)	mg/l	< 10	< 20
11	Chlorine (free)	mg/l	< 1.0	< 2.0
12	Chloride (ion)	mg/l	< 500	< 700
13	Sulphate (as SO ₄)	mg/l	< 300	< 500
14	Sulphide (as Sulphur)	mg/l	< 0.2	< 1.0
15	Phosphate (PO ₄)	mg/l	< 3.0	< 6.0
16	Cyanide (CN)	mg/l	< 0.2	< 1.5
17	Barium (Ba)	mg/l	< 4.0	< 7.0
18	Arsenic (As)	mg/l	< 0.10	< 1.0
19	Tin (Sn)	mg/l	< 2.0	< 8.0
20	Iron (Fe)	mg/l	< 1.0	< 20
21	Boron (B)	mg/l	< 1.0	< 5.0
22	Manganese (Mn)	mg/l	< 1.0	< 5.0
23	Cadmium (Cd)	mg/l	< 0.1	< 0.5
24	Chromium (Cr)+3	mg/l	< 0.2	< 1.0
25	Chromium (Cr)+6	mg/l	< 0.05	< 0.5
26	Copper (Cu)	mg/l	< 0.2	< 1.0
27	Lead (Pb)	mg/l	< 0.1	< 1.0
28	Mercury (Hg)	mg/l	< 0.002	< 0.05
29	Nickel (Ni)	mg/l	< 0.2	< 1.0
30	Selenium (Se)	mg/l	< 0.05	< 0.5
31	Silver (Ag)	mg/l	< 0.1	< 0.5
32	Zinc (Zn)	mg/l	< 1.0	< 3.0

No	Parameters	Unit	Allowable limits for pollutant substance discharging to	
			Protected public water area	Public water area and sewer
33	Molybdenum (Mo)	mg/l	< 0.1	< 1.0
34	Ammonia (NH ₃)	mg/l	< 5.0	< 7.0
35	DO	mg/l	>2.0	>1.0
36	Polychlorinated Byphenyl	mg/l	<0.003	<0.003
37	Calcium	mg/l	<150	<200
38	Magnesium	mg/l	<150	<200
39	Carbon tetrachloride	mg/l	<3	<3
40	Hexachloro benzene	mg/l	<2	<2
41	DTT	mg/l	<1.3	<1.3
42	Endrin	mg/l	<0.01	<0.01
43	Dieldrin	mg/l	<0.01	<0.01
44	Aldrin	mg/l	<0.01	<0.01
45	Isodrin	mg/l	<0.01	<0.01
46	Perchloro ethylene	mg/l	<2.5	<2.5
47	Hexachloro butadiene	mg/l	<3	<3
48	Chloroform	mg/l	<1	<1
49	1,2 Dichloro ethylene	mg/l	<2.5	<2.5
50	Trichloro ethylene	mg/l	<1	<1
51	Trichloro benzene	mg/l	<2	<2
52	Hexachloro cyclohexene	mg/l	<2	<2

Remark: The Ministry of Environment and the Ministry of Agriculture, Forestry and Fishery shall collaborate to set up the standard of pesticides which discharged from pollution sources.

Annex 4 of Sub-decree on Water Pollution Control

Water Quality Standard in public water areas for bio-diversity conservation

Source: Sub-decree No. 42 ANRK.BK on Water Pollution Control, MOE, 1999.

a) River

Parameter	Standard	
	Unit	Value
pH	mg/l	6.5 – 8.5

BOD5	mg/l	1 – 10
Suspended Solid	mg/l	25 – 100
Dissolved Oxygen	mg/l	2.0 - 7.5
Coliform	MPN/100ml	< 5000

b) Lakes and Reservoirs

Parameter	Standard	
	Unit	Value
pH	mg/l	6.5 – 8.5
COD	mg/l	1 – 8
Suspended Solid	mg/l	1 – 15
Dissolved Oxygen	mg/l	2.0 - 7.5
Coliform	MPN/100ml	< 1000
Total Nitrogen	mg/l	1.0 – 0.6
Total Phosphorus	mg/l	0.005 – 0.05

Annex 5 of Sub-decree on Water Pollution Control:

Water Quality Standard in public water areas for public health protection

- The CNDWQS Standard is National Standard of the Ministry Industry and Handicraft.

No	Parameter	Unit	Standard Value
1	Carbon tetrachloride	µg/l	< 12
2	Hexachloro-benzene	µg/l	< 0.03
3	DDT	µg/l	< 10
4	Endrin	µg/l	< 0.01
5	Dieldrin	µg/l	< 0.01
6	Aldrin	µg/l	< 0.005
7	Isodrin	µg/l	< 0.005
8	Perchloroethylene	µg/l	< 10
9	Hexachlorobutadiene	µg/l	< 0.1
10	Chloroform	µg/l	< 12
11	1,2 Trichloroethylene	µg/l	< 10
12	Trichloroethylene	µg/l	< 10
13	Trichlorobenzene	µg/l	< 0.4
14	Hexachloroethylene	µg/l	< 0.05
15	Benzene	µg/l	< 10
16	Tetrachloroethylene	µg/l	< 10
17	Cadmium	µg/l	< 1

18	Total mercury	µg/l	< 0.5
19	Organic mercury	µg/l	0
20	Lead	µg/l	< 10
21	Chromium, valent 6	µg/l	< 50
22	Arsenic	µg/l	< 10
23	Selenium	µg/l	< 10
24	Polychlorobiohenyl	µg/l	0
25	Cyanide	µg/l	< 0.005

(4) Groundwater Quality Standard

No	Parameter	Standard	
		Unit	Value (CNDWQS Standard)
1	pH	-	6.5-8.5
2	Turbidity	NTU	5.0
3	Dissolved Oxygen (DO)	mg/l	NV
4	Total Suspended Solid (TSS)	mg/l	NV
5	Chloride (Cl ⁻)	mg/l	250
6	Nitrate (NO ₃)	mg/l	50
7	Phosphate (PO ₄)	mg/l	NV
8	Sulphate (SO ₄)	mg/l	250
9	(BOD) ₅	mg/l	NV
10	(COD) Mn	mg/l	NV
11	Aluminum (Al)	mg/l	0.2
12	Arsenic (As)	mg/l	0.05
13	Copper (Cu)	mg/l	1.0
14	Iron (Fe)	mg/l	0.3
15	Lead (Pb)	mg/l	0.01
16	Manganese (Mn)	mg/l	0.1
17	Mercury (Hg)	mg/l	0.001
18	Zinc (Zn)	mg/l	3.0
19	Total Coli form	MPN/100mlml	0

(5) Soil Quality Standard

Source: Cambodia National Quality Standards for agriculture, Ministry of Agriculture, Forest, and Fishery (MAFF).

Parameter	Standard	
	Unit	Value
pH		

Salinity	ppt	6-8
Oil & Grease	mg/kg	-
Chloride	mg/kg	-
Petroleum Hydrocarbons		
Kerosene hydrocarbons, (c10-c14)	mg/kg	-
Diesel hydrocarbons, (c15-c28) (mg/L)	mg/kg	-
Heavy oil hydrocarbons, (c29-c36) (mg/L)	mg/kg	-
BTEX		
Ethylbenzene	mg/kg	0.018
Benzene	mg/kg	0.0068
Toluene	mg/kg	0.08
Xylene	mg/kg	2.4
Metals		
Nickel	mg/kg	50
Copper	mg/kg	63
Zinc	mg/kg	200
Arsenic	mg/kg	12
Cadmium	mg/kg	1.4
Lead	mg/kg	70
Iron	mg/kg	-
Chromium	mg/kg	64
Mercury	mg/kg	6.6

Annex 5: COVID-19 Monitoring Checklists

1. Prevention Measures

Below is a checklist for prevention measures.

N.o	Preventing measures to COVID-19, some measures are needed to be implemented as below:	Yes	No
1	Dissemination about COVID-19 prevention and mitigation measures to staff and workers through orientation or distributing leaflet/poster at information/safety board at each construction and camp site;		
2	Daily checking temperature of staff and workers prior starting the works;		
3	Staff and workers have to wear masks all the time and properly;		
4	Do not share personal items or supplies such as phones, pens, notebooks, tools, etc.;		
5	Avoid common physical greetings, such as handshakes;		

6	Maintain a minimum physical distance of one metre from others if possible;		
7	Wash hands often with soap and water for at least 20 seconds after using the washroom, before handling food, after blowing nose, coughing, or sneezing, and before smoking. If hands are not visibly soiled, and soap and water are unavailable, alcohol-based hand sanitizer can be used;		
8	All offices and jobsites implement additional cleaning measures of common areas. All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal workstation areas are wiped down at least twice a day with a disinfectant, such as disinfectant wipes. Individuals are responsible for cleaning and disinfecting their workstations;		
9	Commonly touched surfaces on vehicles and equipment are thoroughly cleaned and disinfected at the end of shifts and between users;		
10	Coughing or sneezing into a tissue or the bend of your arm, not your hand; And dispose of any tissues you have used as soon as possible in a lined waste basket and wash your hands afterwards;		
11	Complying with any instructions announced by Ministry of Health accordingly		

2. Response measures: Possible cases of COVID-19

Below is a checklist for prevention measures:

N.o	Responding measures if there is a COVID-19 case, some measures are needed to be implemented as below:	Yes	No
1	Individuals who have been potentially exposed to the virus, or who are exhibiting flu-like symptoms such as fever, tiredness, coughing, or congestion are instructed to: ▪ Not come to work; ▪ Contact their supervisor and/or human resources department; ▪ Stay at home and self-isolate; and ▪ Contact local health authorities for further direction.		
2	Such individuals are required to follow the directions of the local health authority and may not return to work until given approval by the proper health authorities;		
3	Individual who begin to display flu-like symptoms on site are instructed to avoid touching anything, take extra care to contain coughs and sneezes, and return home immediately to undergo self-isolation as directed by the local health authority;		
4	All areas on site potentially infected by a confirmed or probable case are barricaded to keep individuals two meters away until the area is properly cleaned and disinfected.		

Note: Additional COVID-19-related checklist/form, please go to this link:
<http://www.cdcmoh.gov.kh/resource-documents/covid-19-documents/494-2019-ncov-documents-management>