Environmental Management Plan

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Timor-Leste: Dili West Water Supply Project: Package Area 03 - Central

Prepared by the Ministry of Public Works for the Asian Development Bank.

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ABBREVIATIONS

ACMs	-	Asbestos Containing Materials
ADB	-	Asian Development Bank
ANAS	-	National Agency for Water and Sanitation
ANLA	-	National Agency for Environmental Licensing
ASC	-	Aldeia and Suco Council
BTL	-	Be'e Timor-Leste (National Water Company)
DAP	-	Department for Protected Areas
DED	-	Detailed Engineering Design
DEQC	-	Department of Environment and Quality Control
DNCP	-	National Directorate for Pollution Control
DWWSP	-	Dili West Water Supply Project
EMP	-	Environmental Management Plan
EMR	-	Environmental Monitoring Report
EHS	-	Environment, Health and Safety
GRM	-	Grievance Redress Mechanism
H&S	-	Health and Safety
IEE	-	Initial Environmental Examination
IFC	-	International Finance Corporation
MPW	-	Ministry of Public Works
O&M	-	Operation and Maintenance
PA	-	Package Area
PD	-	Project Document
PDC	-	Project Design Consultant
PMU	-	Project Management Unit
PMC	-	Project Management Consultant
SEA	-	Superior Environmental Authority
SEIS	-	Simplified Environmental Impact Statement
CEMP	-	Site-specific Construction EMP
SPS	-	Safeguard Policy Statement
WTP	-	Water Treatment Plant

GLOSSARY

Suco	-	an administrative sub-division equivalent of a village
aldeia	-	equivalent of a hamlet or community

WEIGHTS AND MEASURES

°C	-	degree Celsius
cm	-	centimeter
dBA	-	A-weighted decibel
km	-	kilometer
km^2	-	square kilometer
L	-	liter

LA_{eq}	-	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
mm	-	millimeter
m^3	-	cubic meter
m^3/d	-	cubic meter per day (flow measurement)
mg/L	-	milligram per liter
MPN/100 mL	-	most probable number per 100 milliliters (coliform count)
$\mu g/m^3$	-	microgram per cubic meter
PM_{10}	-	particulate matter 10 micrometers or less
$PM_{2.5}$	-	particulate matter 2.5 micrometers or less

NOTE

In this report, "$" refers to US dollars, "BTL" refers to Be'e Timor-Leste, and "Dili -West" refers to the joint supply area of Package Areas (PA) 01 - Be'e mos, PA 02 - Malinamuk, PA 03 - Central, PA 05 - Maloa and PA 08 - Golgota, unless otherwise stated.

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1. INTRODUCTION

1.1. Project Overview

1. The Dili West Water Supply Project (DWWSP) will support the Government of Timor-Leste to provide safe, reliable, and affordable water supply and sanitation to 199,000 people in the west zone of Dili, the capital and largest city of Timor-Leste. It will (i) finance the construction of new and capacity increase of existing facilities for water supply services and (ii) strengthen the regulatory and institutional capacity of both the Ministry of Public Works (MPW) and the newly established state-owned water utility, Bee Timor-Leste (BTL), in service delivery, planning, financial management, and operation and maintenance (O&M).

2. The project will provide access to water supply services in the west zone of Dili to at least 199,000 people (50% of whom are women). The access should be uninterrupted with a minimum pressure of 3 meters water column and meeting national drinking water quality standards. The amount of water that does not generate revenue (non-revenue water; losses, unauthorized and unbilled consumption) is reduced to maximal 20% of the amount of water supplied to the system.

3. The project will construct new and upgrade water sources and treatment facilities with a combined capacity of 49,858 m^3/day, which is sufficient to fulfill the expected mean daily demand in 2050. The project will expand the clean water reservoir capacity to 23,400 m^3 and construct a new distribution system with a total length of 276 kilometers.

4. The distribution system will include several isolation valves, pressure relief valves, and bulk water meters to form five isolated pressure zones and a total of 19 district metering areas (DMA's), which is essential in effective pressure and leakage management of the system.

5. An Initial Environmental Examination (IEE) was prepared as the preliminary environmental evaluation for the Dili West Water Supply Project (DWWSP) and was carried out during the Detailed Design phase, in accordance with ADB's Safeguards Policy Statement (SPS) 2009, and the Government of Timor-Leste environmental requirements and guidelines currently in effect.

6. The IEE concluded that the water supply project in Dili is not likely to have significant adverse environmental impacts that are irreversible, diverse, or unprecedented, potential direct environmental impacts are mostly construction related and unlikely to affect areas larger than the sites or facilities subject to physical works. These impacts are site-specific, few if any of them are irreversible, and in most cases can be prevented or mitigated with standard construction methodologies and procedures and operational safety measures designed with uncomplicated measures commonly used at construction sites and known to civil works contractors.

7. During the preparation of the IEE for the component, this Environmental Management Plan (EMP) was also prepared.

1.2. Environmental Management Plan Purpose

8. This document is the Environmental Management Plan (EMP) for DWWSP Package Area 03 - Central. It is based on the preliminary Detailed Engineering Design. It will be updated as required with the Final Detailed Engineering Design and any required mitigation measures from national due diligence. This EMP will also be

updated during project implementation in order to accommodate any project contact variations, corrective actions, project scope changes or other changes affecting due diligence requirements. An updated version of the EMP will be provided to the contractor. All updated versions of IEEs and EMPs will be disclosed on ADB's website on behalf of the borrower.

9. The EMP ensures all the project activities are in compliance with technical designs, environmental legislation and guidelines applicable in Timor-Leste and within the ADB SPS 2009. Objectives of the EMP are:

(i) To provide a feasible and practical working tool to enable the measurement and monitoring of environmental performance on-site.
(ii) To guide and control the implementation of findings and recommendations of the environmental assessment conducted for the project.
(iii) To identify specific actions deemed necessary to assist in mitigating the environmental impact of the project.
(iv) To ensure that safety recommendations are complied with.

10. The EMP is based on the identified environmental impacts for Package Area 03 - Central and has been prepared following best practice and in accordance with ADB SPS (2009). It includes detailed requirements for:

(i) Mitigation and monitoring measures.
(ii) Institutional arrangements and project responsibilities.
(iii) EMP budget for implementation.
(iv) Institutional strengthening and technical training requirements.
(v) Public consultation and information disclosure.
(vi) GRM including timescale and responsibilities.

11. The costs for the EMP implementation are regarding the construction (7 years), estimated at the following:

- Mitigation Measures i.e., EHS Officer: $131,000
- Environmental Quality Monitoring: $63,000
- Institutional strengthening, technical training, consultation: $42,200

Total: $236,200

12. The Council of Administration of Infrastructure Fund, Ministry of Finance is the executing agency for the project. The overall responsibility for EMP implementation lies with the MPW. The MPW will establish a Project Management Unit based in Dili, responsible for general project implementation with the support of BTL, and consulting support from a Project Management Consultant.

2. PROJECT OUTLINE

13. DWWSP aims to rehabilitate, extend and improve existing water abstraction, treatment and distribution facilities in Dili City West to water demands up to 2040. The project is divided into 5 investment Package Areas (PA). PA 03 - Central, under the current project, comprises 3 components in the construction phase:

- Water Sources (New and Upgraded Boreholes)
- Water Treatment and Storage System
- Water Distribution Network (Transmission, Mains and Distribution)

14. The major components of the proposed project components for the PA 03 - Central, under the current project, are shown in Appendix 1 and Table 1.

Table 1 Infrastructure Investments for PA 03 - Central

Proposed Components	Proposed Capacity	Notes
Water Sources		
BH05, 06, 08, 09 and 10	21,830 m^3/day	Existing, to be upgraded, cleaned and purged.
New Borehole	5000 m^3/day	New drilling
Water Treatment and Storage		
WTP Central	6,000m^3	Existing WTP, not in project scope
Reservoir and disinfection	14,200m^3	To be expanded from 3,000m^3 and old one demolished
Water Distribution		
Upgrade (Mains and Distribution)	164,152 Km	Full distribution network replaced - primary, secondary and tertiary pipes with nominal diameter varying from 600 to 63 mm

3. POTENTIAL RECEPTORS AND IMPACTS

15. The impacts of the project are influenced by the presence of receptors in the project area. Without receptors, there will not be any impacts. The receptors are summarized in Table 2.

16. In addition to facility-specific receptors, there are housing, businesses, cultural sites and access requirements that are also considered impact receptors at all locations where construction of the components occurs.

Table 2 Summary of Receptors in Project Area

Component	GPS	Receptors Surface Water	Receptors Socio-Economic and Cultural	Land Cover/ Ecological	Protected Area Status
Water Sources					
Borehole #05	Lat: 8°33'19.58"S Lon: 125°32'21.34"E	None	Within the BTL Borehole Compound., next to BH06. High density housing/dwelling surrounding the site. 15m from urban road.	Urban Area	None
Borehole #06	Lat: 8°33'19.58"S Lon: 125°32'21.34"E	None	Within the BTL Borehole Compound, next to BH05. High density housing/dwelling surrounding the site. 15m from urban road.	Urban Area	None
Borehole #08	Lat: 8°33'52.44"S Lon: 125°32'10.92"E	None	Inside BTL Compound, surrounded by High density housing and Service area.	Urban Area	None
Borehole	Lat: 8°34'24.10"S	None	Inside BTL Manleu Asgor Tank	Urban Area	None

Component	GPS	Surface Water	Receptors Socio-Economic and Cultural	Land Cover/ Ecological	Protected Area Status
#09	Lon: 125°31'55.84"E		Compound, 150m from Comoro River, and surrounded by High density housing.		
Borehole #10	Lat: 8°34'19.62"S Lon: 125°32'9.68"E	None	Surrounded by High density Commercial area, within the Manleu Market Tank compound.	Urban Area	None
Borehole #New	Lat:8°33'20.53"S Lon: 125°31'58.61"E	None	High density Service area within the INAP compound.	Urban Area	None
Water Treatment and Storage					
WTP Central	Lat: 8°34'0.50"S Lon: 125°33'31.12"E	None	Inside WTP Central compound, Special Use Area.	Gardened by BTL, Amenity purpose, not sensitive.	None
New Reservoir (South Expansion)	Lat: 8°34'0.50"S Lon: 125°33'31.12"E	None	Predominantly housing to the West, South and Southeast WTP boundary. The South Expansion area includes affected houses and a telecommunications tower currently under review for compensation and relocation.	Peri urban, on a hilltop, (steep inclination = +45% to East and West), with a few open grass fields and sparse trees to the South.	None
Distribution					
PA 03 - Central	Suco Comoro, Bebonuk, Fatuhada, Kampung Alor, Motael, Colmera, Vila Verde and Bairro Pité, (Dili)	Comoro River (W of Bebonuk boundary)	High Density Urban housing, mixed used commercial and Special Use areas.	No natural areas within the PA	None

17. A summary of likely adverse impacts on the receptors during construction stages of project development is presented below in Table 3:

Table 3 Summary of Significant Impacts to Project Receptors

Impact Type	Construction Phase
Air quality	Moderate temporary impacts are anticipated because of fugitive dust generation associated with all construction works, earth works and waste movements.
Noise	Noise impacts will be temporary and localized at all construction sites as construction machinery and vehicles generate noise while in operation.
Water (Surface)	Expansion construction of reservoir will take place in area close to a network of natural drainage channels that discharge downhill, with possible impacts to community. Short-term impacts from construction may be seen in terms of increased turbidity, accidental spills during maintenance, daily campsite activity or improper disposal of construction waste.
Soil and Land use	Improper disposal of excavation soils. Possible modification of site topography, soil erosion and sedimentation to surrounding receptors due to site clearing and vegetation removal (if required), as well as ground levelling, excavations for the foundation of structures and pipe laying.
Biodiversity (flora and fauna)	All components are in urban area with no significant natural fauna or flora. Potential impact on nationally protected trees (*ficus sp*.) known to be in the project area. Tree felling to be controlled and "as-needed".
Solid waste management	Impacts on resource use and affects associated with waste generated during construction i.e. disposal of inert wastes, excavated material from construction, demolition wastes, biodegradable wastes (cleared vegetation), and hazardous wastes i.e. oily wastes from spills from construction machinery. Impact on public health from asbestos containing materials if not properly identified managed and disposed of in accordance with EMP.
Community and occupational health and safety (H&S)	Construction sites and access roads on hilltops may mean H&S and traffic risks to construction workers and the community and dwellers living and working around the construction sites, excavation and trench work. The risk of transmitted diseases i.e., sexually transmitted and COVID-19 in the community may also likely increase due to the closer contact of the sub-contractor teams with the community, particularly if there is an influx of migrant workers.
Culture	Cultural/sacred sites throughout the PA (see Table 4). As activity will be mainly within right of way (ROW), with proper mitigation and prevention measures significant impacts are not expected. However, review of ROW by Contractor is required before construction commences, to confirm if new locations

Impact Type	Construction Phase
	arise. If construction opening/closing traditional ceremonies are required and carried out no social impact is expected.
Socio-economic (accessibility and economic)	The installation of water distribution pipe networks will require the excavation of parts of the roads and footpaths, in an urban and peri-urban setting where businesses and other activities take place. Community disruption by impaired access to their properties and businesses. Project will provide Local employment generation and enhance worker skills.

Table 4 List of Cultural Heritage Sites identified in PA03 - Central

No.	Name of Site	Coordinates	Type	Distance from Site Border
1	Kotis Farol (Farol de Dili)	8°32'53.82"S 125°34'7.47"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
2	A-74-99 Foundation Building	8°32'54.80"S 125°34'6.62"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
3	Mr. Adelino Silva Residence / Fomento Building	8°33'17.18"S 125°34'1.53"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
4	Motael Central Elementary School	8°33'6.00"S 125°34'6.40"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
6	Sporting Clube de Timor-Leste Head Office	8°33'15.11"S 125°34'33.76" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
8	BNU Head Office	8°33'17.41"S 125°34'33.88" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
12	Former Dr. Francisco Machado High School (UNTL)	8°33'15.32"S 125°34'33.99" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
13	UNTL Library UNTIM	8°33'37.16"S 125°34'20.15" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
24	Former Agricultural Society (SAPT)	8°33'20.74"S 125°34'32.52" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
28	Ensul Head Office	8°33'17.59"S 125°34'31.50" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
85	Hotel Timor	8°33'14.94"S 125°34'24.72" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
91	Antigo Posto de Alfandega	8°33'23.40"S 125°33'47.50" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
94	Antiga Aerogare de Dili	8°33'23.40"S 125°33'47.50"	Architectural Heritage	Distribution Parallel to boundary (<10m)
95	Edificio Residencial-FSC TIPO B Funcionarios do BNU	8°33'9.72"S 125°34'5.68"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
96	Edificio Residencial Sr. Fernando da Costa Soares	8°33'9.80"S 125°34'12.00" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
99	Edificio Residencial Sr. Vergilio e Rede sociedade Civil Hasatil	8°33'7.85"S 125°34'5.80"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
100	Edificio Residencial Sr. Jorge Emanuel Soares	8°33'1.50"S 125°34'6.80"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
106	MIAP_Edificio Comercial	8°33'12.70"S 125°34'12.20" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
107	Edificio Residencial Habitante	8°33'11.18"S 125°34'13.59" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
109	Edificio Residencial Benjamim da Silva Sarmento & Officina Militar	8°33'1.30"S 125°34'1.70"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
110	Residencia Sr. Adelino da Silva	8°33'16.17"S 125°34'1.76"	Architectural Heritage	Distribution Parallel to boundary (<10m)
111	Edificio Residencial Sr. Delio Ximenes Teixeira	8°33'12.90"S 125°34'7.80"E	Architectural Heritage	Distribution Parallel to boundary (<10m)

No.	Name of Site	Coordinates	Type	Distance from Site Border
112	Edificio Residencial Sr. Fernando de Fatima Sarmento Ximenes	8°33'13.50"S 125°34'7.00"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
113	Edificio Residencial Sr Luis Francisco de Gonzaga Soares	8°33'14.15"S 125°34'9.22"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
114	Edificio Residencial Sra. Ana Maria Costa	8°33'11.03"S 125°34'11.44" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
115	Edificio Residencial-Habitante Sra. Teresa Rego Faria Reis	8°33'11.63"S 125°34'15.02" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
116	Edificio Residencial-Habitantes Sr. Cornelio A. Lopes	8°33'13.60"S 125°34'16.50" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
117	Edificio Residencial-FSC TIPO B Sra. Joana de Fatima Magno Ximenes Antigas Residencias dos funcionarios do BNU	8°33'13.30"S 125°34'6.80"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
118	Edificio Sra. Carminda Carlota	8°33'10.30"S 125°34'9.60"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
119	Edificio Residencial Sra. Maria Emilia Batista Gusmão	8°33'9.60"S 125°34'16.50" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
120	Edificio Residencial Sra. Luisa Maria de Jesus Xavier	8°33'4.50"S 125°34'8.20"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
121	Edificio Residencial-Bahai-Instituição Religiosa	8°33'2.31"S 125°34'8.32"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
122	Edificio Residencial Sr. Francisco do Nascimento	8°33'8.20"S 125°34'6.90"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
123	Edificio Residencial Liro Soares Saldanha	8°33'7.20"S 125°34'13.30" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
124	Edificio Residencial-Habitante Sr. Jose do Rosario Ximenes e Maria Felomena de Carvalo Ximenes	8°33'8.20"S 125°34'15.60" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
125	Edificio Residencial Hotel Vasco da Gama	8°33'9.13"S 125°34'14.83" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
126	Edificio Residencial Antiga Messe de Oficiais	8°33'11.19"S 125°34'19.20" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
127	Edificio Residencial-Estado Tribunal de Rescursos	8°33'4.90"S 125°34'15.40" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
128	Edificio Residencial Escritorio da JICA Atual Escritorio da Organização Japan Internacional	8°32'59.40"S 125°33'56.00" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
130	Edificio Residencial Dom Luis de Gusmão	8°33'8.30"S 125°34'18.00" E	Architectural Heritage	Distribution Parallel to boundary (<10m)
131	Edificio Residencial Sr Joaquim da Costa Sarmento	8°33'12.00"S 125°34'7.90"E	Architectural Heritage	Distribution Parallel to boundary (<10m)
29	Sang Tai Hoo	8°33'20.81"S 125°34'17.92" E	Historic Heritage	Distribution Parallel to boundary (<10m)
30	SGI	8°33'19.39"S 125°34'8.44"E	Historic Heritage	Distribution Parallel to boundary (<10m)
36	UNTIM	8°33'37.16"S 125°34'20.15" E	Historic Heritage	Distribution Parallel to boundary (<10m)
31	Dili´s Port	8°33'11.88"S 125°34'28.77" E	Historic Heritage	Distribution Parallel to boundary (<10m)
32	Kotis	8°32'59.62"S 125°33'54.92" E	Historic Heritage	Distribution Parallel to boundary (<10m)
35	SENOPATI	8°33'31.20"S	Historic Heritage	Distribution Parallel to boundary

No.	Name of Site	Coordinates	Type	Distance from Site Border
		125°34'9.04"E		(<10m)
37	Mota Maloa	8°33'34.51"S 125°33'54.03" E	Historic Heritage	Distribution Parallel to boundary (<10m)
59	Camara Eclesiastica	8°33'15.23"S 125°34'27.83" E	Historic Heritage	Distribution Parallel to boundary (<10m)
61	Brimob Quartel Bairopite	8°33'49.64"S 125°33'39.74" E	Historic Heritage	Distribution Parallel to boundary (<10m)
63	Tasi Tolu	8°33'30.30"S 125°30'24.68" E	Historic Heritage	Distribution Parallel to boundary (<10m)
5	Liberator Statue Monument	8°33'13.22"S 125°34'20.86" E	Cultural Heritage	Distribution Parallel to boundary (<10m)
38	Rosa Mukit Bonaparte Garden	8°33'16.17"S 125°34'7.84"E	Cultural Heritage	Distribution Parallel to boundary (<10m)
54	Jardim 5 de Maio	8°33'13.22"S 125°34'20.86" E	Cultural Heritage	Distribution Parallel to boundary (<10m)
55	Mercado Tais	8°33'18.22"S 125°34'11.53" E	Cultural Heritage	Distribution Parallel to boundary (<10m)
64	Igreja de Santo Antonio de Motael	8°33'3.52"S 125°34'14.10" E	Sacred or Religious Heritage	Distribution Parallel to boundary (<10m)
34	Dili Cathedral	8°33'30.15"S 125°34'3.60"E	Sacred or Religious Heritage	Distribution Parallel to boundary (<10m)
49	Lulik Vila Verde	8°34'6.05"S 125°34'9.14"E	Sacred or Religious Heritage	Distribution Parallel to boundary (<10m)
73	Rate Aldeia Zero III	8°33'2.95"S 125°33'6.18"E	Sacred or Religious Heritage	Distribution Parallel to boundary (<10m)
81	Perumnas Chapel	8°33'45.11"S 125°33'41.15" E	Sacred or Religious Heritage	Distribution Parallel to boundary (<10m)
82	Surikmas Chapel	8°33'51.12"S 125°33'10.76" E	Sacred or Religious Heritage	Distribution Parallel to boundary (<10m)

3.1. Risks, project impacts and contractor expectations summary

18. The following is a summary of the key Environment, Health and Safety (EHS) risks, project related impacts and expectations on contractors to manage the risks and impacts. The expectations set out for the contractor match the requirements in the EMP.

Table 5 EHS Risk, Impact and Expectation Summary

EHS Issue	Risk	Impact	Expectation on contractor
1. Managing labor and working conditions	Labor standards are not maintained, and equal opportunities are not given to local workers and women.	Non-compliance with national laws, and inequalities in employment opportunities and conditions.	The contractor will comply with all national labor standards and all labor requirements set out in the EMP attached to the bidding documents.
2. Environmental protection	Air and water pollution, soil erosion, soil contamination and noise generation.	Deterioration in local environmental quality.	The contractor will not cause significant or long-term deterioration of the natural environment.
3. Health and	Accidents or incidents	Life changing health impact	The contractor will maintain a safe

	safety on site	from working around traffic, in trench excavations and general construction	or fatality on site, within the work force.	and secure working environment for all workers / staff.
4.	Community health and safety	Accidents involving the community on construction sites and during pipe network installation.	Life changing health impact or fatality within the community.	The contactor will maintain a safe environment for the communities living and working around the project site(s).
5.	Hazardous materials management	Loss of containment of hazardous chemicals and exposure to asbestos.	Long term health impacts from chemical and fiber exposure and localized environmental deterioration.	The contractor will ensure hazardous materials are managed to prevent injury to humans or impact on the natural environment through controlled release or uncontrolled loss of containment.
6.	Resource efficiency	Inefficient use of local and imported materials and poor waste segregation/recycling.	Generation of waste in a location without high standards of waste treatment and disposal facilities.	The contractor will use resources efficiently to reduce waste generation and resource inputs. All wastes will be managed according to the waste hierarchy.
7.	Pollution prevention and management	Fuel and lubricants spill, and pollution from construction drainage.	Deterioration in local environmental quality.	The contractor will not cause pollution of the natural environment. Pollution risks will be managed through the contractor's emergency plans which the contractor will provide in response to this EMP. Ground works will be undertaken in the dry season where possible.
8.	Flora conservation /cultural heritage	Removal of or damage to culturally significant trees without prior permission.	Relationship with local community breaks down and project is hindered.	The contractor will not remove any tree without authorization and without cultural leadership approval if the tree is culturally significant. The contractor ensures all trees which are not planned for removal will be protected from accidental damage.

4. INSTITUTIONAL ARRANGEMENTS AND RESPONSIBILITIES

19. The key institutions, organizations, and stakeholders relevant to the environmental management are set out below.

20. The overall responsibility for EMP implementation lies with the Ministry of Public Works as the Implementing Agency (IA). MPW will establish a Project Management Unit based in Dili, responsible for general project implementation with the support from Be'e Timor-Leste (BTL).

21. BTL has a Department of Environment and Quality Control (DEQC) in its structure, of which part of its responsibilities is to assess and monitor all Environment and Social Safeguards under the BTL projects. A qualified member of DEQC will be nominated to become a member of the PMU (environmental safeguards focal person) and thus is reflected under BTL responsibilities in Table 6.

22. In addition, the project will include a Project Management Consultant (PMC) to support MPW and BTL in environmental safeguards training, monitoring, contractor supervision and relevant due diligence and reporting. This consultant will include relevant national/international environmental specialists to carry out these responsibilities.

23. A summary of the key functions for project implementation and environmental safeguards and detail on the responsibilities of each function is in Table 6.

Table 6 Key Functions and Responsibilities for Environmental Safeguards

ROLES AND RESPONSIBILITIES	
Pre-Construction Phase	**Construction Phase**
Ministry of Public Works (Implementing Agency)	
• Overall responsibility for project design and implementation. • Provide support and operating budget to the PMU. • Ensure that sufficient funds are available to properly implement all agreed environmental safeguards measures. • On behalf of the Government, ensure that the project, regardless of financing source, complies with the provisions of development partners' policies to supplement as required by environmental laws and regulations.	• Supervision of implementation and management of all activities under the DWWSP so that they are conducted in accordance with: (i) the IEE/EMP(s), (ii) the national environmental, health and safety laws, regulations, procedures, and guidelines, (iii) relevant design standards and codes, and (iv) international best practices.
Project Management Unit (PMU)	
• Oversee the incorporation of EMP recommendations into the design, bid documents and O&M Manuals, and, if applicable, the revision of IEE and corresponding EMP(s). • Ensure EMP(s) are part of the bidding documents, EMP clauses are incorporated in bidding documents, contracts. • Ensure procurement of environmentally responsible contractors. • Ensure that all necessary approvals are secured prior to civil work contract award (e.g.: Environmental License from ANLA, construction permits, and pre-approval may be required from the National Culture	• Conduct inspections and spot checks to monitor performance of the Contractors in implementing ADB-cleared EMP and approved site-specific Construction EMP(s) (CEMPs) by the PMU. • Ensure with support of the PMC any corrective action plans and monitoring implementation and compliance of the contractors. • Collect and review monthly EMRs from the Contractors. • Prepare and submit semi-annual EMRs to ADB and ANLA. • Oversee and monitor management and resolution of grievances as well as

ROLES AND RESPONSIBILITIES	
Pre-Construction Phase	**Construction Phase**
Directorate and the Lia Nain of the area, and any others required) • Ensure that any conditions coming out of the domestic environmental license are included into the updated IEE and corresponding EMP(s). • Ensure translation of the IEE Executive summary /SEIS Executive summary / and EMP Mitigation Measures table into Tetum, to distribute to the Chefes de Suco and Chiefs of Aldeia, for local public access to information, creating wider public awareness. • Review and approve the final CEMP(s) of the winning or selected Contractors, and inform ADB of this approval for their assurance before awarding the no objection letter for commencement of works. • Establish EHS baseline conditions in affected locations/villages. • Conduct consultation with affected people. • Establish GRM (environment and social) and making affected persons aware of GRM focal points, contacts, and procedures. • Conduct an awareness campaign on health and safety issues for the project and on the grievance redress mechanism.	effectiveness of the established grievance redress mechanism. • Conduct appropriate consultation and monitoring of effect of construction on affected people. • Oversee observance of the grievance redress mechanism and prepare semi-annual grievance redress reports as an input to semi- annual component EMRs. • Ensure, with support of the PMC, new and/or update exiting environmental due diligence assessments in case of project variations and ensure new and/or updated environmental due diligence reports are disclosed locally, as well as to the ADB website. • Ensure re-approval of any updated CEMPs due to project variations before any variation works can proceed.
Design Consultants	
• Incorporate all IEE/EMP requirements and recommendations into the Component's detailed designs, bid documents and O&M Manual. • Prepare and finalize PD, SEIS and EMP Reports based on the IEEs and EMPs, for Licensing purpose.	• Not Applicable
Contractor	
• Appoint an EHS Manager for the project construction. • Arrange or directly conduct environmental sampling to form the pre-construction environmental quality baseline (noise, air quality, water). • Finalize CEMP (and required corresponding plans), with inputs comments from PMU/BTL and seek PMU approval. • Ensure no works commence without the following being in place: 1) the domestic environmental license 2) PMU's approval of the CEMP 3) any cultural authorizations and cultural ceremonies to be completed as needed 4) any environmental permits and clearances. This applies to any additional works under contract variations. • Organize disclosure of the Component's information before commencement of	• Engage or mobilize engineers to manage the CEMP's implementation and reporting. • Implement all environmental mitigation and protection measures, conduct environmental monitoring activities and ensure preparedness for emergency responses, as provided in the ADB-cleared EMP and PMU approved CEMP. • Observe the grievance redress mechanism in addressing complaints. • Prepare monthly EMP progress and Health and Safety reports for submission to the PMU. • Ensure any time-bound corrective action measures and/or plans are implemented and provide reporting on this to the PMU. • Ensure CEMPs are updated in case of any project variations and secure approval from the PMU before any variation works can commence.

Pre-Construction Phase	ROLES AND RESPONSIBILITIES Construction Phase
works.	
Project Management Consultants (PMC)	
• Provide initial environmental awareness training to the PMU and BTL on CEMP and EMP including purpose, content, roles, and responsibilities in implementation and environmental safeguards related training for PMU, MPW, contractors and stakeholders including GRM awareness. • Finalize the IEE and EMP(s) (also including any conditions coming out of the domestic environmental licensing). • Ensure that all relevant safeguards of the approved EMPs are adequately addressed in the bidding documents. • Review bidding documents, review CEMP against the EMP. • Support the PMU to ensure that all necessary approvals are secured prior to civil work contract award (e.g.: Environmental License from ANLA, construction permits, and pre-approval may be required from the National Culture Directorate and the Lia Nain of the area, as well as any others). • Translate the IEE Executive summary /SEIS Executive summary / and EMP Mitigation Measures table into Tetum, to distribute to the Chefes de Suco and Chiefs of Aldeia, for local public access to information, creating wider public awareness. • Confirm project readiness.	• Conduct inspections in monitoring performance of the Contractor in implementing the CEMP. • Collect monthly EMRs from the Contractors, prepare and submitting semi-annual EMRs to PMU, ANLA and ADB. • Oversee and monitor the management and resolution of grievances and effectiveness of the grievance redress mechanism. • Prepare any required corrective action plans and monitor compliance and adherence by the contractor. • Conduct any additional environmental impact assessment work in case of any project variations and prepare new or updated environmental due diligence reports/IEE or EMP(s) accordingly, and support with re-disclosure and translation of required sections (Executive Summaries and EMP mitigation measures table) to Tetum. • Guide the contractors for uptake of any additional EMP measures into their CEMPs and support the PMU with clearance of any updated CEMPs. • Provide ongoing environmental and social safeguards related training for PMU, MPW, contractors and stakeholders.
Local and National Authorities	
• ANLA to Review, comment and approve the SEIS and EMP. • Concerned Chefes de Suco and Aldeia shall be involved in: (i) Public disclosure of the IEEs and EMPs as well as the executive summaries of the IEEs and SEIS and EMP mitigation tables in Tetum (also in case of project variations). (ii) Contractor employment mechanism (local contracting numbers). (iii) Community awareness program on health and safety impacts of the EMP implementation. • Department for Protected Areas (DAP) to coordinate with ANLA on authorization for project implementation in Protected Area, as "Zone of Use." • ANAS to review proposed water extraction volumes and advise on approval.	• ANLA to monitor compliance with SEIS and EMP. • Municipality and Suco Council to participate in the monitoring of the Contractor performance in EMP implementation. • Chefes de Suco and Aldeia shall be involved in grievance resolution pursuant to grievance redress mechanism.
ADB	
• Clear the submitted IEE and EMP. • Review bid documents, which include the incorporation of IEE recommendations, and final EMP.	• Review and clear semi-annual EMRs, any required IEE and EMP updates and any corrective action plans. • Conduct annual environmental review

ROLES AND RESPONSIBILITIES	
Pre-Construction Phase	**Construction Phase**
• Issue required clearances or No-objections. • Disclose environmental due diligence documents on the ADB website on behalf of the borrower.	missions during construction. • Provide SPS 2009 environmental safeguards implementation guidance as and when necessary. • Disclose environmental due diligence documents on the ADB website on behalf of the borrower.

4.1. Institutional Capacity Review and Needs

24. Currently there is limited experience of monitoring and implementing environmental mitigation measures, as well as limited enforcement of environmental or health and safety legislation or undertaking of routine environmental monitoring apart from infrequent projects under environmental impact assessment licensing procedure in urban centers (air and noise quality) or regular sampling in river systems (water quality).

25. The BTL's DEQC is staffed with two senior environmental technicians and water quality laboratory staff. From DEQC, the MPW will assign an environmental safeguards focal person to the PMU.

26. While there is a need for BTL to continue to provide more environmental safeguard officers nationally, it should also consider preparing at least one officer at the BTL Municipality level (Dili included) so that they can manage, review IEEs/EMPs and participate in construction monitoring without overwhelming their existing work agenda. It is important to include all relevant environmental staff in project institutional strengthening and technical training.

27. This is paramount to project success as the MPW will perform key roles in supporting the PMU in implementing the EMP and ensuring the pre-construction and construction requirements are in place.

28. In addition, through understanding the existing operations for the water distribution system in Dili, it is clear that, while some progress has been demonstrated over the years, given the demanding water maintenance environment in the capital, the ability for operation and maintenance is still not at the required level as operators have been unable to maintain adequate standards given (i) an overall existent lack of technical capacity and experience; (ii) lack of staff in the field; and particularly (iii) budget is not yet at levels that may allow for corporate and operational independence in the water business.

29. A seven year (2023 to 2030) institutional strengthening and technical training program is set out in Table 6 to address the environmental and social risks and safeguard reporting and implementation requirements during construction. The costs are estimated and specific to delivering the event, noting the staff and consultant time are included in their respective main contracts.

Table 7 Institutional Strengthening and Technical Training

Subject / Content	Trainees	Trainer / Organization	When / Frequency	Event, Duration and Participants (pp)	Cost per Event ($)	Operational Cost (USD) and Budget Source
EMP Development and Implementation EMP function, Roles, and responsibilities, EMP monitoring (site visits) Reporting on Environmental Safeguards	PMU/BTL Contractors	PMC (Environmental Safeguards Specialist)	2 events - 1x before construction + 1x after 6 months of construction	2 events x 2 days x 10 pp	$1,000	$2,000 (PMC Budget)
Affected People Training Affected Persons management, dealing with and consideration	Contractor Staff	PMC (Social Safeguards Specialist)	15 events - 1x before Construction 1 x each Semester	15 events x 1 day x 30 pp	$1,000	$15,000 (PMC Budget)
Consultation with Affected People Consulting during construction, types of consultation, methods	BTL / PMU Contractors	PMC (Social Safeguards Specialist)	29 events - 1x before Construction 1 x each quarter	29 events x 1 day x 8 pp	$500	$15,000 (PMC Budget)
Grievance Redress Mechanism Roles, responsibilities and implementation	BTL/ PMU Contractors Municipality Suco and Aldeia Chiefs	PMC (Social and Environmental Safeguards Specialist	2 Events - 1x before construction + 1x after 6 months of construction	2 events x 2 days x 30pp	$2,000	$4,000 (PMC Budget)
Environmental Protection Pollution control on construction sites (air, noise, wastewater, solid waste)	BTL / PMU Contractors	PMC (Environmental Safeguards Specialist)	1 Event - 1x before construction	1 event x 1 day x 10pp	$1,000	$1,000 (PMC Budget)
Environmental Monitoring Monitoring methods, data collection and processing, reporting systems	BTL / PMU Contractors	PMC (Environmental Safeguards Specialist)	1 Event - 1x before construction	1 event x 1 day x 10pp	$1,000	$1,000 (PMC Budget)
WTP/Reservoir Operation and Maintenance - Environment related Management issues.	BTL/ PMU WTP/Tank Operators	Contractor - Environmental Specialist PMC (Environmental Safeguards Specialist)	1 Event - 1x before Operation	1 event x 5 days x 6pp	$700 per pp	$4,200 (PMC Budget) 1
					TOTAL	**$42,200**

5. MITIGATION MEASURES PLAN

30. Comprehensive mitigation measures are set out for the project in Table 8, covering pre-construction, construction, and operation.

31. The Contractor is expected to develop a site-specific Construction Environmental Management Plan (CEMP) for the project, which is a detailed plan that sets out the contractor's approach to implementing the required mitigation measures. The activities and mitigation measures reflect best-practice measures typical of the project's nature and, where relevant, specific to the conditions of the project components of PA 03 – Central.

32. **Guidance for Contractor**. More guidance on CEMP development can be found in Appendix 2, where the mitigation measures are grouped per component. Appendix 2 is NOT the CEMP structure but includes the basis of the minimum expected mitigation measures under this EMP. The contractor is expected to include additional actions and explanatory methodologies in the CEMP, in order to guarantee the project is duly environmentally safeguarded.

33. The project includes many construction measures that also serve an environmental purpose, therefore the distinction between the budget detailed design, engineering works and environmental safeguard measures becomes blurry. Examples include environment, health and safety (EHS) issues, and traffic management measures; transport of spoil, waste management. The costs of these mitigation measures will therefore be covered by the design consultant, contractor, project management consultant (PMC) and/or Government's normal budget estimates for project construction and operation.

34. In order to distinguish these in the EMP budget, it is assumed that all design-related measures are under the design consultant budget and construction-related measures are included in the construction contractor's budget, and only those that may be considered distinct from the pure engineering components of the project are included as EMP budget, under the respective responsible organization's budget in Table 8.

35. The costs identified to implement the mitigation measures pertain to operational costs and do not include costs for specialists (e.g. staff or consultant time).

Table 8 EMP Mitigation Measures

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
PRE-CONSTRUCTION (DESIGN) PHASE									
0.1 Disclosure & Engagement of community	(No impacts)					01.1. Initiate Information Disclosure and Grievance process of IEE in PA 3 Central.	BTL / PMU / PMC	MPW	PMC Budget
0.2. GRM Dissemination	(No impacts)					0.2.1. Establish GRM and clarify roles and responsibilities (see GRM section of EMP). 0.2.2. Provide contractor with GRM contact details to be used for: A. GRM sign boards; B. GRM Contact Cards for Affected People.	BTL/ PMU / PMC	MPW	Government Budget
						0.2.3. Erect sign boards at the construction site entrance with: A. Project details B. GRM procedures and contact details. 0.2.4. Print 'GRM Contact Cards' for all workers to give to complainants and keep cards with all vehicles, machinery and site managers.	Contractor	BTL / PMU	Contractor Budget
						0.2.5. Affected People Training. PMC to raise awareness of all Contractor 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.'	PMC	MPW	PMC Budget 0.2.5. ($15,000)
						0.2.6. Provide GRM Training to Contractors, Municipality and Sucos/Aldeias.	PMC	MPW	PMC Budget 0.2.6. ($4,000)
0.3. IEE and EMP Updated	(ALL)					0.3.1. Updated IEE and EMP to include: A. Final detailed design B. Additional site-specific environmental protection measures and receptors C. Approved national SEIS/EMP requirements & mitigation measures D. Environmental quality baseline monitoring (water, air, noise) to be provided by the contractor E. SEIS/EMP approved by Secretary of State for Environment prior to contract award	Design Consultant / PMC	BTL/ PMU / ADB	Design Consultant Budget
						0.3.2. Environmental Management and Monitoring Training to Contractors and PMU/BTL.	PMC	MPW	PMC Budget 0.3.2 ($2,000)
0.4. Construction EMP (CEMP)	(ALL)					0.4.1. The contractor(s) will develop a Construction EMP (CEMP) that includes the mitigation measures set out in this table and grouped in Appendix 2. Guidance requirements for CEMP mitigation measures, and will include detailed individual management measures for: A. Sensitive Areas Management Plan B. Cultural Sites Safeguard Plan C. Campsite and Construction site Management Plan (if required) D. Spoil and Demolition Waste Management Plan (see also Appendix 7 for applicable measures) E. Community and Occupational EHS and Emergency Response F. Traffic Management Plan G. COVID-19 Management Plan (see C3.3.7 and Appendix 3 for applicable	Contractor	BTL/ PMU / PMC	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
						COVID-19 Protection and Mitigation Measures)			
						0.4.2. The CEMP will include a map of each construction site, with copies held by the Contractor and BTL, showing as a minimum: a) Access routes, b) storage areas for waste, c) storage area for chemicals such as fuels, d) concrete mixing, e) stockpile storage areas (on & off site), f) first aid kit and equipment used in emergency response e.g. fire / spill response, g) location of worker camps (if required).	Contractor	BTL/ PMU /PMC	Contractor Budget
0.5. Obtain & activate permits and licenses	Compliance Obligations					0.5.1. Contractors to comply with all statutory requirements set out by Government for use of construction equipment, and operation construction plants.	Contractor	BTL/ PMU	Included in Bid price
						0.5.2. Contractor to ensure all required permits are in place prior to construction, such as (but not limited to): - Materials extraction permits; - Cultural Site Construction Protection License (for each cultural site <50m from project component).	Contractor	BTL / PMU	Included in Bid price
0.6 Labour						0.6.1 Following the Domestic EMP requirements: - The contractor will strictly screen labor/workers based on the required skills and local should be priority in hiring. - The contractor will Implement a 70% local labor hiring; - The number of international personnel and laborers should be actively minimized by the contractor. The CEMP should explain the Contractor's approach to recruitment in order to meet the above requirements.	Contractor	BTL / PMU	Included in Bid price
PC1. WATER SOURCES									
1.1. Location in Protected and/or Sensitive Areas or Species	1.1. Nuisance to the biodiversity (flora, fauna, water ecosystem) due to dust, silt runoff, noise, etc.	1	3	4	MS-	<u>1.1.1.1. Contractor Improved Awareness with Sensitive and/or Protected Areas or Species</u> Guarantee contractor is trained, accepts and follows all operational procedures applicable within these areas and/or species. Contractor must not: • Kill, injure, damage, remove, handle, disturb or interfere with any endangered species or existing animals under any circumstances. • Bring domesticated animals on-site. • Poaching on-site or the surrounding forests. • Sell endangered species or derivatives of these species. • Export endangered or derivatives of these species. • Cleared trees without DNAP/Forest Guard inspection for nesting birds prior to cutting. The nest will be transferred carefully to another tree safe from project activities. • Carry out clearing of vegetation before a detailed layout of clearing is presented by the contractor and approved by the DNAP plant new/invasive species in the Project area, for reforestation purposes	PMC / PMU	MPW	PMC Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
		1	4	4	MS-	1.1.1.2. Tree protection and/or felling procedures The contractor to carry out pre-construction visits to ROW alignments for identification, counting and approval of all common species trees proposed for felling. Contractor to review as follows: *a) Common Trees* 1) Check if Tree requires felling. 2) If not, protect during construction. 3) If felling is required, seek approvals from General Directorate for Forestry (Department of Protected Areas) and define compensation measures, such as Replanting "1-for-1 to 10" (each common species tree felled) in areas requiring reforestation. Compensation tree numbers to be coordinated between BTL and DAP. *b) Protected/Endangered Species of Trees* 1) Follow steps a) 1) and 2) above 2) If a protected/endangered tree requires felling, seek DAP felling approval and substitution numbers for planting of the same tree species (at a quantity to be determined). 3) For sacred species i.e. "Ai-Hali", contractor must seek approval and agreement from the cultural leader or Lia-nain, SEAC, DAP and Biodiversity regarding approval for felling and tree substitution/compensation (as per National Directorate for Biodiversity guidance, replanting will require more effort from proponent, at a scale between 20 and 100 "-for-1" (each protected species tree felled).	PMC / PMU	MPW	PMC Budget
1.2. Use water sources (springs and boreholes	1.2.1. Insufficient water for all users	2	4	8	S-	1.2.1.1. Comprehensive monitoring and assessment of all water source availability throughout project implementation (springs and borehole monitoring program for aquifer performance tracking).	PMC	PMU/BTL - MPW	Government Budget
	1.2.2. Water use between environment, communities and Water Distribution System	2	3	6	S-	1.2.2.1. Apply a minimum environmental flow for all springs (Wet Season 30% of mean monthly flow / Dry Season 10% of mean monthly flow), for Downstream free flow and usage. For boreholes do not extract at 24h, in order to allow some aquifer recharge.	BTL	BTL - MPW	Government Budget
	1.2.3. Social and cultural disruption due to tara bandu and lulik/sacred or heritage areas	1	4	4	MS-	1.2.3.1. a) Involve lia na'in in frequent cultural ceremonies i.e. "opening" for authorization to use cultural/natural water resource, if required. (5 activities @$1,000 each). b) Project activities during construction phase will be monitored by assigned personnel from the Culture Department. c) Precautionary measures will be taken by all construction workers to prevent damage to the Lulic sites.	PMC / BTL/ PMU	MPW	Contractor Budget a) $5,000
1.3. Protection of the water source for distribution purposes	1.3.1. Drying up of the BTL boreholes and private wells close by due to over extraction from Distribution network boreholes and vice-versa	2	5	10	S-	1.3.1.2. Land use planning reclassification of the area for "no abstraction" and implement Water Resource Management regulations.	BTL	MPW / PMU	Government Budget
PC2. WATER TREATMENT AND PROPOSED STORAGE									

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
2.1. New installation of disinfectant system in the proposed or selected storage	2.1.1. Waterborne disease towards consumers due to Water sources with lower quality and not in compliance with WHO standards	2	3	6	S-	2.1.1.1. Upgrade of the design of new treatment plant and storage facilities by applying disinfection, chlorination or Calgon dosing system.	Design Consultant	PMU / MPW	Design Consultant Budget
						WTP/Reservoir O&M Training on Environmental Management issues to WTP/Tank operators and PMU/BTL.	PMC / BTL/ PMU	MPW	Contractor Budget a) $4,200
2.2. Remodeling / rehabilitation of existing water tanks	2.2.1. Insufficient treated water due to leakages (poor infrastructure) and lesser capacity of the water tanks	2	3	6	S-	2.2.1.1. Increase the water storage capacity and design by adjusting water demand estimation for 2030.	PMC / BTL/ PMU	MPW	Design Consultant Budget
PC3. PROPOSED DISTRIBUTION NETWORK									
3.1. Identification of cultural, historical & touristic sites	3.1.1. Impairment of the cultural heritage properties due to construction activities	3	5	15	S-	3.1.1.1. Prepare Cultural Sites Safeguard Plan for each cultural site under risk and request license for each at the Cultural Directorate before construction commences. Project activities during construction phase will be monitored by assigned personnel from the Culture Department. Preparation of the rehabilitation activity must be done together with the Directorate that represents the Secretariat of State for Culture at the Municipal level. Pre-construction, the contractor must review these immovable asset locations and request approval of a Safeguard Plan for each of the assets, making sure that during the Construction activities, those sensitive heritage sites within 50 m radius of the construction activities should not be interfered with or impacted on, and the rules as mentioned in Decree Law No. 33 /2017 for Cultural Patrimony Protection are followed, with the request, by the contractor, of a license /authorization for intervention in the area. The sites will be demarcated to limit construction works outside the area and restrict access to the sites unless authorized by relevant authority. In case a new cultural/historical heritage site is identified during the construction, the Contractor will notify the BTL and follow the same procedure regarding these sites. Precautionary measures will be taken by all construction workers to prevent damage to the sites. After construction operations, the contractor shall seek clearance from relevant authorities that the sites are in their natural state prior to departure.	Contractor	MPW / PMC / BTL / PMU	Contractor Budget
3.2 Preparation of Project for H&S and O&M	3.2.1. Risk to Workers H&S - General	2	3	6	S-	3.2.1.1. Preparation of a Health and Safety Plan in accordance with National Law, IFC EHS 2007 and ADB SPS 2009 guidelines to ensure the following: Provision of suitably qualified staff for EHS function Train all site personnel on environmental health and safety including toolbox talks on equipment operation and task safety; Provide PPE and ensure its proper utilization;	Contractor	MPW / PMC / BTL / PMU	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
						For working near water, train staff in specific associated risks, and ensure adequate provision of life jackets, life belts, and warning signage; Health and safety training and toolbox meeting, including the communicable diseases and operational system of the equipment; Maintain records of reports and complaints concerning health & safety occurrences; Installation of sick bay in the base campsite including recruitment of medical staff (intermittent, on-call) for primary response prior delivering to the hospital or closest clinic; Emergency response plan (procedures for responding to emergencies including accident, fire in worker camps, chemical or fuel spillages and other emergencies the contractor envisages) and collection of all contacts in Dili related to accident response; Ensure safe working conditions e.g. install cautionary signage and safety instructions throughout construction site, Ensure moving equipment is outfitted with audible backup alarms; Construction site free of drugs and alcohol; COVID-19 related mitigation measures (see C.3.3.7 and Appendix 3 for applicable COVID-19 Protection and Mitigation Measures). Ensure Material Safety Data Sheets for all chemicals are retained on site and the advice on environmental and personal health protection measures followed.			
		2	3	6	S-	3.3.1.2. Catalogues, manuals and signage shall be provided in Tetum translation.	Contractor	BTL / PMU / PMC	Contractor Budget
	3.2.2. Risk to Community H&S - Traffic Accidents and Communicable Diseases	2	6	12	S-	3.3.2.1. Traffic management plan Prepare traffic management plan which will include: a) How the contractor will inform the community and businesses of construction traffic routes and traffic safety/awareness. b) Any advice/information the contractor will give to affected people during construction. c) How the contractor will manage traffic including any road closures. d) how the contractor will restrict access to the active construction areas and minimize road accidents to the local community through using adequate warning signs with good quality high visibility barriers. Trained traffic marshal will be used to direct vehicle movements on and around construction sites and in all urban areas. Disseminate information in the Traffic Management Plan to the community Speed limits will be determined for vehicles, below 50 km/hour per hour in city area and <40 km/hour in residential areas Apply the H&S Plan and distance the community from physical, chemical or other hazards associated with sites under construction and decommissioning (including COVID-19 related prevention and reaction (see C3.3.7 and Appendix 3 for applicable COVID-19 Protection and Mitigation Measures).	Contractor	MPW / PMC / BTL / PMU	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
		3	2	6	S-	3.3.2.2. Disseminate information i.e., information flyers to the community within the ROW radius of the project area related to transmissible disease i.e., COVID-19, etc. and relation to project activities.	Contractor	MPW / BTL / PMU	Contractor Budget
CONSTRUCTION PHASE									
C1. WATER SOURCES									
1.0. Activities related to Infrastructure Construction	1.0.1. General Impacts (noise, air quality, siltation, H&S, etc.)					(see C3. Water Distribution for related impacts mitigation measures).			
1.1. Inadequate protection of boreholes structures during rehabilitation	1.1.1. The water from borehole will flow and may cause soil/silt erosion.	2	2	4	MS-	1.1.1.1. Temporary drainage provision that links to safe surface water drainage.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
	1.1.2. Socio-cultural impact	3	2	6	S-	1.1.2.1. Involvement of *lia naín* for cultural ceremony preparation (see PC1.2.3.1.).	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
C2. WATER TREATMENT AND PROPOSED STORAGE									
2.0. Activities related to Infrastructure Construction	2.0.1. General Impacts (noise, air quality, siltation, H&S, etc.)					(see C3. Water Distribution for related impacts and mitigation measures).			
2.1. Upgrading construction activities for water tanks and water treatment plant	2.1.1. Chemical substance exposure towards the workforces due to disinfection installation	2	3	6	S-	2.1.1.1. Provision and obligatory use of PPE for chemical handling.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
C3. PROPOSED DISTRIBUTION NETWORK									
3.1. Induction of Contractor	3.1.1. Enhanced impacts because of lack of knowledge of the EMP	3	3	9	S-	3.1.1.1. Induction meeting for EMP understanding and Project “Go-ahead”.	PMC / BTL / PMU	MPW	PMC Budget ($2,000)
3.2. Construction Activities – Macro Benefits	3.2.1. Local Employment Generation	3	3	9	S+	3.2.1.1. Recruitment of skilled and unskilled workers from affected community, in coordination with the local authorities – also see Pre-Construction requirements 0.6.1 regarding labor criteria.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
	3.2.2. Enhance workers' skills	3	3	9	S+	3.2.2.1. “on-the-job” training program for workers, particularly unskilled workers.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
3.3. Construction campsite	3.3.1. Campsite Location and Landslides	2	2	4	MS-	3.3.1.1. Establishment of camp on stable and flat surface area, and where it would not cause soil erosion. Preference must be given to site on Government land. Any use of private land will require written approvals/agreements to be in place. Site will not be in a floodplain, not be located near settlements, water supply intakes or sites that affect local access to drinking water. All sites must apply mitigation measures to prevent impacts to surrounding	Contractor	MPW / BTL / PMU / PMC	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
						community and environment i.e. wastewater, waste, dust, noise. After use, sites shall be cleared and restored to status as they were and, if required due to their surroundings, to near natural or stable conditions with vegetative cover.			
	3.3.2. Wastewater and soil/water contamination	2	3	6	S-	3.3.2.1. Establishment of a Proper Sanitation System Installation of appropriate temporary latrine with Septic Tank for construction workers in the campsite, at least 30 m away from any water source. Preferably portable toilets will be used by the contractor. Sanitation will be elevated to an appropriate level or sites to reduce flood risk in the wet season.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
	3.3.3. Water Source for Campsite may compete with Community Sources	2	2	4	MS-	3.3.3.1. Establish a water tank and source water for construction from BTL authorized sources.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
						3.3.3.2. Purchasing sufficient potable water supply in the form of liter bottles or in gallons, for all construction staff throughout the duration of the construction activities.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
	3.3.4. Storage and Management of Hazardous chemicals and materials may bring spills, fire hazards and H&S problems	2	3	6	S-	3.3.4.1. Proper storage and handling of chemicals and materials Allocation of proper containments and labeled, suited for the nature of chemicals and/or waste will be provided by the contractor and maintained throughout the duration of the Construction phase. Refueling only in designated areas which are to be 50 m from a water course and drip trays to be used when refueling or topping up / changing machinery fluids. Materials hauled directly to work front, minimizing storage at campsite. Asbestos containing material i.e., used pipes to be identified, managed and disposed of in accordance with management plan to be included in the CEMP. Train/Inform workers/draft Guideline on identifying and risks of handling Asbestos Containing Materials (ACMs). Prepare special team to remove ACMs from construction areas. Coordinate with DNCP to determine final solution for ACMs. Follow the mitigation measures for Asbestos in Appendix 4 in this EMP.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
	3.3.5. Non-hazardous Solid Waste Improper handling and storage and vector diseases	2	2	4	MS-	3.3.5.1. Implementation of Solid Waste Management System. Minimize domestic type waste production on site and manage waste according to the waste hierarchy, with preference given for reuse, then recycling and least preference is disposal where possible. Immediate disposal of waste in designated bins/areas induced by the contractor. Waste bins will be kept closed to prevent the accumulation of water during rain events. Regular emptying of waste bins and transport to approved disposal sites i.e. Tibar Landfill, with coordination with local authorities of appropriate dumpsites. Construction and demolition waste will be managed according to the Spoil and Demolition Waste Management Plan.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
						The waste hierarchy will be applied to construction and demolition waste, with preference given for reuse, then recycling and least preference is disposal.			
	3.3.7. COVID-19 transmission risks between workers and community in Camp and Work sites	3	3	9	S-	3.3.7.1. COVID-19 Construction site and Work Site Management mitigation measures • National COVID-19 requirements will be followed at all times. Appendix 3 COVID-19 indications are recommended. • Appendix 3 indications will be followed for campsite and worksite management • Plan and execute work in compliance with country-specific COVID-19 risk management regulations and directives including directions of the General Department of Labour, Secretariat of State of Labour, and Vocational Training. • Conduct workplace risk assessment to identify low, medium or high exposure risk to COVID-19. Include an action plan for prevention and mitigation of the spreading of COVID-19 in the Community and Occupational EHS Plan. • Risk communication, training, and education. Training of workers in infection prevention and control practices. • Adopt engineering, organizational and administrative measures, plan work so employees can keep distance from each other and minimize contact. • Provide clear and visible guidelines on how to prevent infection at the construction site and initiatives taken. • Regularly clean and disinfect. • 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. • Promote personal hygiene (including hand and respiratory hygiene), make washbasins and sanitizers available at entry, break area, and washrooms. • Provide PPE and inform workers of its correct use. • Health surveillance and insurance. • Regularly review emergency preparedness plans. • Review and update preventive and control measures as the situation evolves and Involve workers/ occupational H&S groups in the review.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
3.4. Construction Materials	3.4.1. Sand and stone Extraction and disturbances to environment	2	5	10	S-	3.4.1.1. Sand and Stone Sourcing Management a) Source all new materials from licensed companies/suppliers under the National Authority for Petroleum and Minerals Authority (ANPM).	Contractor	BTL / PMU / PMC	Contractor Budget
						b) Weekly supervision to allow regulating the source of the materials, ensure good condition of the extraction sites and assure quantities of materials conform to project specifications, to reduce the generation of spoils in the construction site.	PMC	BTL / PMU	PMC Budget
3.5. Construction Work Front: All Infrastructure	3.5.1. Servicing and Fueling of Construction Equipment and spills and pollution	2	4	8	S-	3.5.1.1. Equipment and Vehicle Maintenance and Monitoring Ensuring all construction vehicles are in good condition and an acceptable state of repair before the start of the construction phase;	Contractor	MPW / BTL / PMU / PMC	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
						Prohibition of use of dilapidated equipment and vehicles with leaks and causing spills. Designating suitable locations for re-fuelling and changing oil and lubricant with closed drainage preventing contaminated wastewater escape. Any contaminated wastewater will be treated, and hydrocarbons removed prior to discharged. Accidental spills will be cleaned immediately and provision of drip trays to collect any oil or fluid drips. Fuel will be stored in a central depot, made of concrete slab or impermeable surface with secondary containment capable of containing at least a volume of one container, located within the central base camp. Waste Oil/fuel to be delivered at Tibar waste oil plant, under Superior Environmental Authority (SEA).			
	3.5.2. Excavation, Cutting and Filling and safety hazards to Public and workers	3	3	9	S-	3.5.2.1. General Management of Tank/WTP Expansions and Distribution Construction site. Contractor operators Training sessions and daily construction planning in sensitive risky areas. Provide engineering procedures and equipment to avoid landslides and/or rock-falling in risky areas. Set up adequate demarcations/barriers and establish visible warning signs in excavated, cut and filled areas for safety precautions (pedestrians and traffic), especially no entry zones in hillside excavations, to avoid entrance of unauthorized persons into dangerous areas.	Contractor	MPW / BTL / PMU / PMC	Contractor Budget
	3.5.3. Stockpiling and Storage of Construction materials and dust, water runoff damage to existing utilities due, buildings and drainage blockage	2	3	6	S-	3.5.3.1. Spoils and Stockpiles Handling and Storage Plan a) All stockpiles to be situated within the campsite or designated areas on-site that can easily be accessed by equipment and personnel and will cause minimal interference to the movements of vehicle and personnel in the project site. Identify stockyard areas in consultation with local administration, if not in base camp. b) Cover stockpiles with impermeable material like plastic, to protect from wind and rain events. c) Reuse excess spoils and materials at all times, preference must be given to use of spoil in other BTL construction sites, or, if extra but good quality, option of delivery to existing commercial quarry companies for retreatment and reuse. d) Uncontaminated spoil to be disposed of in Government approved sites but CANNOT be on agriculturally productive land, within 50m of a water course, including stream, river or irrigation channel, on sloped land, within 50m of cultural heritage sites, within 100m of any other culturally or ecologically sensitive feature. e) No communities will be given excavated spoil unless it is tested in a laboratory for contaminants and has regulatory and community approval f) As a last option, send spoils to Tibar landfill, if approved by Dili Municipality.	Contractor	MPW / PMU / PMC	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
						The contractor will develop and follow a Spoil and Demolition Waste Management Plan (Appendix 7).			
	3.5.4. Excavation, Cutting and Filling and soil Erosion	2	2	4	MS-	3.5.4.1. Excavation procedures Excavations will only be started once all required materials and services are on their allocated sites and a layout already established for the transport of materials. Excavations, cuttings and fillings will be carried out in a manner to reduce soil erosion and avoid material falling (see also 3.5.2.) and take the following precautions: a) Proper backfilling trenches; b) Earthworks targeted for dry season as soil erosion vulnerability is high during wet season, thus, stockpiles (sand, cement and aggregates) will not be situated at or near steep areas; c) Exposed soil will be stabilized and re-vegetated to prevent further soil erosion; d) Where access is impeded, provide for temporary passageways and communicate/inform dwellers and institutions .	Contractor	MPW / BTL/ PMU / PMC	Contractor Budget
	3.5.5. Construction and Noise Disturbance to surrounding communities and sensitive areas	3	2	6	S-	3.5.5.1. Implementation of Noise Management Controls; Implementation of working hours (permissible working activity from 7 AM to 7 PM). Limit contractor equipment and vehicle speed to 40Km/h within Package Area. Use of power horns is banned. Queuing and idling of construction vehicles outside the premises of the camp site and outside operating hours specified is prohibited. Dissemination of information to the community.	Contractor	MPW / BTL/ PMU / PMC	Contractor Budget
	3.5.6. Construction and dust (Air quality decrease) to the community	3	2	6	S-	3.5.6.1. Implementation of air quality and dust management controls; a) Watering of surface through water truck, sprinklers or hoses, 2-3 times a day, particularly during dry season and high traffic volume, when near residential or built-up areas, or whenever required due to inspection and/or GRM complaint. b) Keep a detailed log of incidents when excessive visible dust emissions occur, the actions taken, and an approximate rate of water application noted. c) Covering of stockpiles during periods of high wind. d) Minimize movement of heavy vehicles and limit velocity to 40 km/h in residential and 50 Km/h maximum in urban area. e) Cover all loads carrying loose aggregates.	Contractor	MPW / BTL/ PMU / PMC	Contractor Budget
	3.5.7. Impacts on Socioeconomic Resources, Infrastructure and Utilities and Cultural Sites	3	3	9	S-	3.5.7.1. Reduction of Impact on established business activities and others a) Make available temporary access ways to all businesses and activities affected. b. Provide advance warning and issuing a construction schedule to allow people to plan their activities. c) Carry out Affected Persons consultation (every Quarter during the construction).	Contractor	MPW / BTL/ PMU / PMC	a) Contractor Budget b) PMC Budget $15,000
		2	3	6	S-	3.5.7.2. Reduction of Impact on Cultural Sites IF found in project ROWs, follow the Precautionary measures (PC0.5.2), and Heritage License rules for each site, defined by the SEAC (Secretariat of State for Art and Culture and apply measures in PC1.2.3.1 and PC3.1.1.1.	Contractor	MPW / BTL/ PMU / PMC	Contractor Budget

Activity	Potential Impact	Scale of present condition (1-3)	Scale of impact (1-6)	Product	Rating	Mitigation Measures	Responsibility		Estimated Cost ($)
							Implementer	Supervision	
3.6. Site clean-up and rehabilitation of locations	3.6.1. Unattended construction materials left on site may pose health and safety hazards to the public.	2	2	4	MS-	3.6.1.1. Site Clean-up Plan a) All temporary structures, materials, waste, and facilities used for construction activities will be removed and disposed of correctly upon completion of the project. b) Excess rocks and sand as a result of excavation activities are to be disposed of as per 3.5.3.1. prior to departure. c) Latrines and septic tanks will be covered with dried plant matter and soil mix prior to departure.	Contractor	MPW / BTL/ PMU / PMC	Contractor Budget

6. MONITORING

6.1. Monitoring Scope

36. The project monitoring 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 (if required by the ANLA) 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 MPW / PMC to verify EMP compliance during project implementation.

(iv) **Affected People monitoring (consultation).** This is to be conducted by the PMC via consulting affected people on the impacts during construction.

6.2. Project Readiness Assessment

37. Before construction, the PMC will assess the subproject's readiness on environmental management based on a set of indicators and report it to PMU/BTL and ADB. 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 9 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 and approved 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		
5. 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		
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 Appendix 8)	Y/N		
6. EMP financial support	The required funds have been set aside for EMP implementation including institutional strengthening and technical training.	Y/N		
7. Completion of	Required preparation of CEMP including	Y/N		

Indicator	Criteria	Are the criteria met?	If No, What corrective action is needed?	Date for corrective action completion
		Yes/No		
CEMP including associated sub-plans*	associated sub-plans by contractor have been completed and get approval from PIAC			

6.3. Environmental Quality Monitoring

38. Impact on sensitive environmental receptors will be monitored and compared against the relevant national and international standards. During construction, the construction contractor is expected to maintain an adequate budget to ensure environmental monitoring can be undertaken as specified in Table 10.

39. The construction contractor is responsible for the environmental quality baseline requiring physical sampling of the environment (water, air, noise) to be conducted prior to any physical works commencing. The construction contractor will provide the results of the environmental quality baseline to PMU and PMC.

40. Environmental monitoring will be implemented during the construction phase to evaluate the impacts of the project activities on the ambient environmental quality and determine the extent changes resulting from the project. Physical sampling of environmental media is the responsibility of the construction contractor during implementation. This work may be done by a third party e.g. specialists consulting firm, or directly by the contractor if they have adequate skills and equipment.

6.4. EMP Compliance Monitoring

41. For the EMP to be effective, all its mitigation measures must be monitored to ensure they are implemented. Compliance monitoring requirements are summarized in

42. Table 11.

43. The main purpose of environmental performance monitoring is to ensure that the proposed mitigation measures are established and complied with by contractors during the construction phase. Environmental performance monitoring is conducted to evaluate compliance with standard operating procedures, national standards and environment and technical specifications.

44. Note this EMP applies to a 7-year construction phase. After this, it is the responsibility of the MPW to ensure monitoring of operational facilities is incorporated in the operations schedule and carried out routinely.

Table 10 Environmental Quality Monitoring

Environmental Indicators	Location	Method & Frequency	Performance Parameter / indicator	Responsibility		Estimated Costs ($)	
				Supervision	Implementation	Per Sampling period	Total 7 years
Construction Phase							
Air quality – dust	Construction sites and ROW	Visual assessment during the works – daily inspection Apply receptor sensitivity approach in proximity to sensitive receptors and general continual monitoring of excessive dust deposition and/or airborne occurrence, when and where construction active and especially under windy conditions and/or near to residential areas	Observation Interview	BTL / PMU / PMC	Contractor	N/A	N/A
Air quality – dust	Construction sites and ROW, Baseline and whenever there is a complaint regarding dust from project activities	Indicators = PM2.5 and PM10 (ug/m3) Method in accordance with WHO guidelines Total Sampling Periods = 15	Observation Interview Sampling and comparison with WHO 2005 - Air Quality Guidelines	-	-	-	-
		1) Baseline Sampling (monitoring) - to be conducted by contractor after contract award, before physical works, with the following frequency: 1 x Sampling Period (2 sampling sites per Period) = 1 Sampling Period with 2 samples		BTL / PMU / PMC	Contractor	$1,500	$1,500
		2) From Complaints: 2 x Sampling Period (2 sampling sites per Period) once per year x 7 years = 14 Sampling Periods with 28 samples In response to complaint not resolved after application of (additional) mitigation measures		BTL / PMU / PMC	Contractor	$1,500	$21,000
Water quality	Upstream and downstream at nearest water body (canal, river)	Visual inspection during the works – daily Monitor when and where construction	Observation Interview	BTL / PMU / PMC	Contractor	N/A	N/A

Environmental Indicators	Location	Method & Frequency	Performance Parameter / indicator	Responsibility		Estimated Costs ($)	
				Supervision	Implementation	Per Sampling period	Total 7 years
	to construction sites (if water is present and impacted)	active	Increased turbidity, foul odor, oil in the water and other visible wastewater Garbage in waterways				
Water quality	Upstream and downstream at nearest water body (canal, river) to construction sites Baseline and whenever there is a complaint regarding water quality from project activities)	Indicators = Water Quality Parameters in Annex I of DL31/2020 - Water Quality Method in accordance with DL31/2020 - Water Quality (Timorese Legislation) Total Sampling Periods = 15	Observation, Interview Sampling and comparison with DL31/2020 - Water Quality (Timorese Legislation)	-	-	-	-
		1) Baseline Sampling (monitoring) - to be conducted by contractor after contract award, before physical works, if water source present) with the following frequency: 1 x Sampling Period (2 sampling sites per Period) = 1 Sampling Period with 2 samples		BTL / PMU / PMC	Contractor	$500	$500
		2) From Complaints: 2 x Sampling Period (2 sampling sites per Period) once per year x 7 years = 14 Sampling Periods with 28 samples In response to complaint not resolved after application of (additional) mitigation measures		BTL / PMU / PMC	Contractor	$500	$7,000
Noise	Construction sites and nearest sensitive receptor (e.g., residential receptor) (2 locations)	Inspection through rough assessment by answering the question: “Do you have to raise your voice to talk to someone respectively 1 m and 2 m away?” - daily	Observation Interview	BTL / PMU / PMC	Contractor	N/A	N/A
Noise	Nearest residential or sensitive receptors (2 locations)	Indicator: dBA Method in accordance with WHO 1999 -	Observation, Interview Sampling and	-	-	-	-

Environmental Indicators	Location	Method & Frequency	Performance Parameter / indicator	Responsibility		Estimated Costs ($)	
				Supervision	Implementation	Per Sampling period	Total 7 years
	Baseline and whenever there is a complaint regarding dust from project activities	Guidelines for Community Noise Total sampling period = 22	comparison with WHO 1999 - Guidelines for Community Noise				
		1) Baseline Sampling (monitoring) - to be conducted by contractor after contract award, before physical works, with the following frequency: 1 x Sampling Period (2 sampling sites per Period) = 1 Sampling Period with 2 samples		BTL / PMU / PMC	Contractor	$1,500	$1,500
		2) Regular monitoring: 1 x Sampling Period (2 sampling sites per Period) twice per year x 7 years = 14 Sampling Periods with 28 samples		BTL / PMU / PMC	Contractor	$1,500	$21,000
		3) From Complaints: 1 x Sampling Period (2 sampling sites per Period x 1 day) once per year x 7 years = 7 Sampling Periods with 14 samples In response to complaint not resolved after application of (additional) mitigation measures		BTL / PMU / PMC	Contractor	$1,500	$10,500
TOTAL Estimated Cost:							$63,000

Table 11 EMP Compliance Monitoring

Environmental Indicators	Location	Method and Frequency	Performance Parameter / Indicator	Responsibility		Estimated Costs ($)
				Verification	Implementation	
Construction Phase						
Air quality (Dust caused by construction equipment and machinery)	Construction site and Work areas (ROW)	Monthly checking against mitigation measures specified in this EMP	In accordance with Table 10	BTL / PMU / PMC	Contractor	Contractor Budget
Noise (Dust caused by construction equipment and machinery)	Construction site and Work areas (ROW)	Monthly checking against mitigation measures specified in this EMP	In accordance with Table 10	BTL / PMU / PMC	Contractor	Contractor Budget
Water quality (deterioration caused by construction works)	Construction site and Work areas (ROW)	Monthly checking against mitigation measures specified in this EMP	In accordance with Table 10	BTL / PMU / PMC	Contractor	Contractor Budget
Soil and land resources	Quarries and Sand Extraction sites	Monthly checking against mitigation measures specified in this EMP	Volume of construction materials delivered as per BOQ Licensed Suppliers with decent environmental Performance	PMC / BTL / PMU BTL / PMU	Contractor PMC	Contractor Budget PMC Budget
Soil and land resources	Spoil Disposal Sites	Monthly checking against mitigation measures specified in this EMP	Volume ratio of construction spoils and debris delivered for: a) Reuse (quarries, etc.) b) Approved relocation c) Landfill disposal site	PMC / BTL / PMU	Contractor	Contractor Budget
Resource use and natural resource contamination (Sanitation [wastewater, water, and solid waste] Management)	Construction site and Work areas (ROW)	Monthly checking against mitigation measures specified in this EMP	a) Cleanliness and sanitation in camps and field offices b) Safety of hazardous waste storage facilities, hazardous waste collection and disposal arrangements	BTL / PMU / PMC	Contractor	Contractor Budget

Environmental Indicators	Location	Method and Frequency	Performance Parameter / Indicator	Responsibility		Estimated Costs ($)
				Verification	Implementation	
Human health and safety (Implementation of Community and Occupational H&S and Emergency Response)	Construction site and Work areas (ROW)	Monthly checking against mitigation measures specified in this EMP	a) Number of minor and major accidents, and work stoppages due to work-related accidents b) Number of construction accidents involving local residents c) Complaints by local residents related to actions by construction workers	BTL / PMU / PMC	Contractor	Contractor Budget
Human health and safety (Traffic Management)	Construction site and Work areas (ROW)	Monthly checking against mitigation measures specified in this EMP	a) Number of traffic accidents related to construction activities and reasons b) Complaints from adjacent communities	BTL / PMU / PMC	Contractor	Contractor Budget
Community Issues • Environmental impacts of civil works (e.g., solid and liquid waste, erosion, local flooding, and pollution). • Any unforeseen impacts caused accidentally e.g., through spillages • Civil nuisance (e.g., noise, disrupted business and farming activity, social issues, community health and safety). • Impaired use of access roads	At construction locations Accessibility – at all sites of pipe excavations in urban areas	Consultation with community and distribution of Public Information Booklet (PIB) prior to start of construction in a section. Consultation interview with Affected People 4-6 weeks after construction starts and Every 3 months until end of construction	Complaints from Affected stakeholders and communities	BTL / PMU / PMC BTL / PMU	Contractor PMC	Contractor Budget PMC Budget $15,000

Environmental Indicators	Location	Method and Frequency	Performance Parameter / Indicator	Responsibility		Estimated Costs ($)
				Verification	Implementation	
(e.g., traffic issues and access). • GRM and its procedures & key contacts • Accessibility						

6.5. Environmental Policy and Standards

45. The construction and operation phases of the project will follow relevant national and international environmental quality standards.

46. In regards to pollution prevention and control technologies and practices, the Government of Timor-Leste has yet to implement their National Standards for air, water, and noise and therefore, under the legal requirements of the base law for environment, these minimum requirements are safeguarded by the use of World Health Organization (WHO) guidelines and, where non-existent, the IFC Environmental, Health and Safety Guidelines are usually referred to as international good practice, consistent with ADB's SPS 2009 practice.

Table 12 Ambient Air Quality Standards

Parameter	**Averaging Period** [a]	**WHO Air Quality Guidelines** (µg/m³)		**Standards to be followed by Project** (µg/m³)
		Global Update 2005[b]	**Second Edition 2000**[c]	
PM_{10}	Annual	20		20
	24-Hour	50		50
PM_{25}	Annual	10		10
	24-Hour	25		25
SO_2	24-Hour	20		20
	10-minute	500		500
NO_2	1-year	40		40
	1-Hour	200		200
CO	8-hour		10,000	10,000
	15-minute		100,000	100,000
Pb	1-year		0.5	0.5

[a] Due to short term duration of civil works, the shortest period will be more practical to use.
[b] Source: World Bank Group. IFC. 2007. Environmental, Health and Safety General Guidelines.
[c] Source: Air Quality Guidelines for Europe, Second Edition, 2000; WHO Regional Office for Europe, Copenhagen.

Table 13 Noise Level Standards

Receptor / Source	**Standards to be Used for Project WHO Guideline Values for Noise Measured Out of Doors**[a] (one hour LA_q in dBA)	
	07:00 – 22:00	**22:00 – 07:00**
Industrial Area[a]	70	70
Commercial Area[a]	70	70
Educational Area[a]	55	45
Rural Residential Area	55	45
Urban Residential Area	55	45
Mixed Residential Area	55	45
Quiet Area	55	45

[a] Source: World Bank Group. IFC. 2007. Environmental, Health and Safety General Guidelines.

The Guidelines for Drinking Water Quality in Timor-Leste have been drafted based on Guidelines for Drinking Water Quality (WHO, 1993), other guidelines in nearby countries, and various factors of natural, social, and economic aspects in Timor-Leste. The document provides guideline values and testing methods on a certain range of microbiological indicators, chemical substances, and physical properties of water quality, to ensure the drinking water does not pose any significant health risk to consumers and is aesthetically acceptable.

Table 14 Guidelines for Drinking Water Quality in Timor-Leste and comparison with WHO values

Parameters	Units	Timor-Leste (DL 31/2020 – Control of Water Quality for Human Consumption	WHO Guidelines [1] [2]
Bacteriological tests			
Total Coliform	CFU/100 ml	0	0
Escerichia coli (E.coli)	CFU/100 ml	0	0
Physical and chemical tests			
Aluminum	mg/l Al	0.2	0.2
Arsenic	mg/l As	0.01	0.01
Ammonia	mg/l [3]	0.5	1.5
Calcium	mg/l Ca	100	100-300
Chlorides	mg/l CL	250	250
Chlorine	mg/l Cl	0.2-0.6	5
Conductivity	µS/cm	2500	
Color	mg/l Platinum-Cobalt Scale	20	15
Fluoride	mg/l F	1.5	1.5
Hardness	mg/L CaCO3	110-500	200-500
Iron	mg/l Fe	0.3	0.3
Langelier Index		-0.5 – 0.5	-
Magnesium	mg/l Mg	50	-
Manganese	mg/l Mn	0.05	0.1
Nitrate	mg/l [4]	11	50
Nitrite	mg/l [5]	0,15	3
pH	Sorensen	6.5-8.5	6.5-8.5
Sulphate	mg/l SO_4^{2-}	250	250
Taste and odor	dilution rate	Free of taste and odor	Free of taste and odor
Total dissolved solids	mg/L	1000	1000
Turbidity	NTU	5	4

[1] The values indicated are guideline values for microbiological indicators or chemicals that are of health significance in drinking water or recommended values based on other reasons, like the acceptability of water and corrosion control.
[2] Guidelines for drinking-water quality: fourth edition incorporating the first addendum, World Health Organization, 2017.
[3] Ammoniacal nitrogen (mg NH4/l) for WHO and mg/l NH4-N for Timor-Leste legislation.
[4] Nitrate (mg NO3/l) for WHO and mg/l NO3-N for Timor-Leste legislation.
[5] Nitrite (mg NO2/l) for WHO and mg/l NO2-N for Timor-Leste legislation.

7. PUBLIC CONSULTATION AND PARTICIPATION

7.1. Consultation and Participation

47. The IEE procedure for Category B projects, under Decree-Law no. 05/2011, requires the proponent to undergo a full Public Consultation. Likewise, the project follows ADB's Safeguard Policy (ADB, April 2009), which requires borrowers/clients to perform meaningful consultation with affected people.

48. The Technical Assistance team carried out four Public Consultation activities covering all five Package Areas during the due diligence phase. Details of the consultation outcomes are included in the IEE.

49. During Project Implementation and construction, consultation with stakeholders and affected people will continue. The MPW and PMU will collaborate with PMC to undertake consultation after detailed designs are completed and will conduct consultation interviews within 4 to 6 weeks of construction starting and then again, every 3 months until the end of construction. This is set out in the Environmental Monitoring Plan. Consultations may also be conducted throughout project

implementation in case of any project changes and variations, and due to any major grievance issues and corrective action plans.

50. Informal monitoring interviews with affected people will focus on complaints about community disturbance from construction activities, such as construction noise, dust, 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 Appendix 5. This will contribute to project monitoring.

51. All consultation will be undertaken in compliance with national regulation and legislation in force, including those put in place to prevent the spread of COVID-19 (Appendix 3).

7.2. Information Disclosure

52. All IEE and EMPs versions will be disclosed on ADB's website, on behalf of the borrower, as a minimum. The Executive Summaries of the IEE and SEIS, and the EMP Mitigation Measures table translated into Tetum (local language) by BTL and will be distributed to the Chefe de Suco and one copy to each of the Chiefs of Aldeia, for local public access to information, creating wider public awareness. As MPW does not have an active website, additional copies will be made available to the public, on request.

53. An electronic version of the IEE/SEIS/EMP in English and translations as above in Tetum will be placed in a website indicated by the MPW (ADB, Consultant or other) and the stakeholders will be made aware of the grievance register and redress mechanism. IEE and EMPs will also be updated in order to accommodate any project contact variations, corrective actions, project scope changes or other changes affecting due diligence requirements which may include issues raised during consultations.

54. Public disclosure meetings will be conducted at key project stages to inform the public of progress and future plans. Prior to construction start, MPW will issue a Notification on the start date of implementation.

55. A board showing the details of the project will be displayed at the construction site for general public information.

8. GRIEVANCE REDRESS MECHANISM

56. The Grievance Redress Mechanism's (GRM) main objective is to provide a transparent mechanism for the stakeholders and public to voice their social and environmental concerns or issues linked to the project, arising during the pre-construction, construction, and development of the Project, with the objective of ensuring that concerns and potential conflicts can be satisfactorily addressed.

57. Affected Persons (APs) are entitled to lodge a grievance regarding any aspect of the preparation and implementation of the project. The objective of the GRM is to provide a structured process for receiving, assessing, and resolving complaints that is accessible, prompt, fair, guided by laws and local custom, and free of charge. Information about the GRM will be communicated to APs and other stakeholders through public consultations and institutional strengthening conducted during project implementation.

58. The function of GRM is to receive, evaluate and facilitate resolution of affected persons' concerns, complaints, and grievances related to social, environmental, and other concerns on the project in a form of forum which can be accessible to other

related parties with a provision of Complaint Registry Form (See Appendix 6) by the Contractor as described below on the Grievance Procedure.

59. The proposed mechanism for grievance redress of environmental and social matters in construction and operation of the project's infrastructure subcomponents uses existing Suco ("village") and Aldeia ("Hamlet") administrative structures (affected persons/ village committees/ village groups), any of which can be complainants. This benefits the project itself and also the affected persons and stakeholders as the project can resolve any relative disputes before they escalate to a higher level, helping build trust and confidence to the related community members, create productive relationships between the parties and help avoid project delays and increase in cost, thus improving the quality of the work. Affected persons will also benefit from eased and facilitated access to information and provide an effective way to report their grievances and complaints.

60. Every grievance shall be registered by the PMU under a carefully documented process. The BTL will also be involved in the clients' complaints and establish a good network with the chefe de suco and aldeia for cultural facilitation purposes.

8.1. Grievance Redress Process

61. Grievance regarding the process can be redressed up to 4 levels, during the construction, and operation of the project, following the process in Figure 1.

62. At each level of the GRM, written records shall be maintained in a case file that includes (i) a description of the complaint and date received; (ii) contact details of the AP lodging the grievance, iii) memos of meetings and consultations, iv) the agreed resolution or decision to refer to the next level. PMU/BTL is responsible for recording all the complaints for the project, at all levels, with support from PMC as needed; this will form the Complaints Register.

63. For level 1 the GRM access points are varied to allow maximum access for Affected People, including the aldeia chief, the suco chief, a construction site supervisor, a contractor engineer, or a city project coordinator, or direct to the PMU/BTL.

64. The Aldeia and Suco Council (ASC) will receive copies of all complaints on environmental and social safeguards issues during the works. Each GRM access point will need to record any complaints and inform ASC and BTL. For verbal complaints the access point representative must make a written record for the Complaints Register.

65. The Project Supervision Consultant environmental and/or social safeguards specialists will contribute to the GRM with technical support to solve the grievance, if required, and after will agree with the Contractor on the necessary action and reasonable timeframe for correction/response to the grievance, in collaboration with ASC and PMU/BTL.

66. The contractor responsibilities under the GRM include, identifying a staff member that is management level and whom, due to the nature of his/her function, will always be available on site and people shall be informed of his/her presence. The contractor may also be central to finding solutions to any construction related complaints. The contractor is required to raise any grievances lodged directly with their firm or staff immediately to BTL for recording.

67. An example GRM Complaint Recording Form which will form the Complaint Register is provided in Appendix 6. The resolution to the complaint will also be recorded.

68. If the grievance requires local mediation, BTL and contractor representatives should consult quickly with local ASC in the area of related grievance and the affected stakeholder/person to arrive at a conclusion on the correction of the grievance. BTL must follow up on the corrective measure, within the agreed timeframe.

69. If the Contractor has not taken any satisfactory corrective action within the defined timeframe, BTL will elevate the Grievance to the PGC.

70. If satisfactory corrective action is yet to be carried out within the defined timeframe, BTL will elevate the Grievance to the GRC and take action in accordance to environmental/social legal and contractual clauses in effect.

71. If the Grievance cannot be solved at the GRC level, the case will be referred to the court of law to adjudicate the matter.

72. Complainants can also file a direct complaint to BTL, under their official Department for Client Support (Address: BTL, Caicoli, Díli; Telephone: 331 71 57), who will follow up directly with the project. This BTL Department for Client Support is the official grievance redress representative for water supply purposes, when the operation phase of the project comes online.

73. If a resolution is not found, affected people should be encouraged to contact the i) ADB Timor-Leste Resident Mission or ii) the Southeast Asia Department of ADB in Manila. Finally, the Accountability Mechanism of the ADB can be used. The Affected Person should contact the Complaints Receiving Officer of the ADB via the following addresses:

- 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
- amcro@adb.org
- Instructions available here: http://www.adb.org/site/accountability-mechanism/how-file-complaint

74. ADB 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 Timor-Leste judicial system.

75. The Project's GRM should not impede access to the country's jurisdiction or administrative remedies. Accessing the country's legal system and GRM can be done at the same time. If efforts to resolve disputes using the grievance procedures remain unresolved or unsatisfactory, the AP has the right to directly discuss his/her concern/complaint with ADB.

Figure 1 - Grievance Redress Procedure for the Project

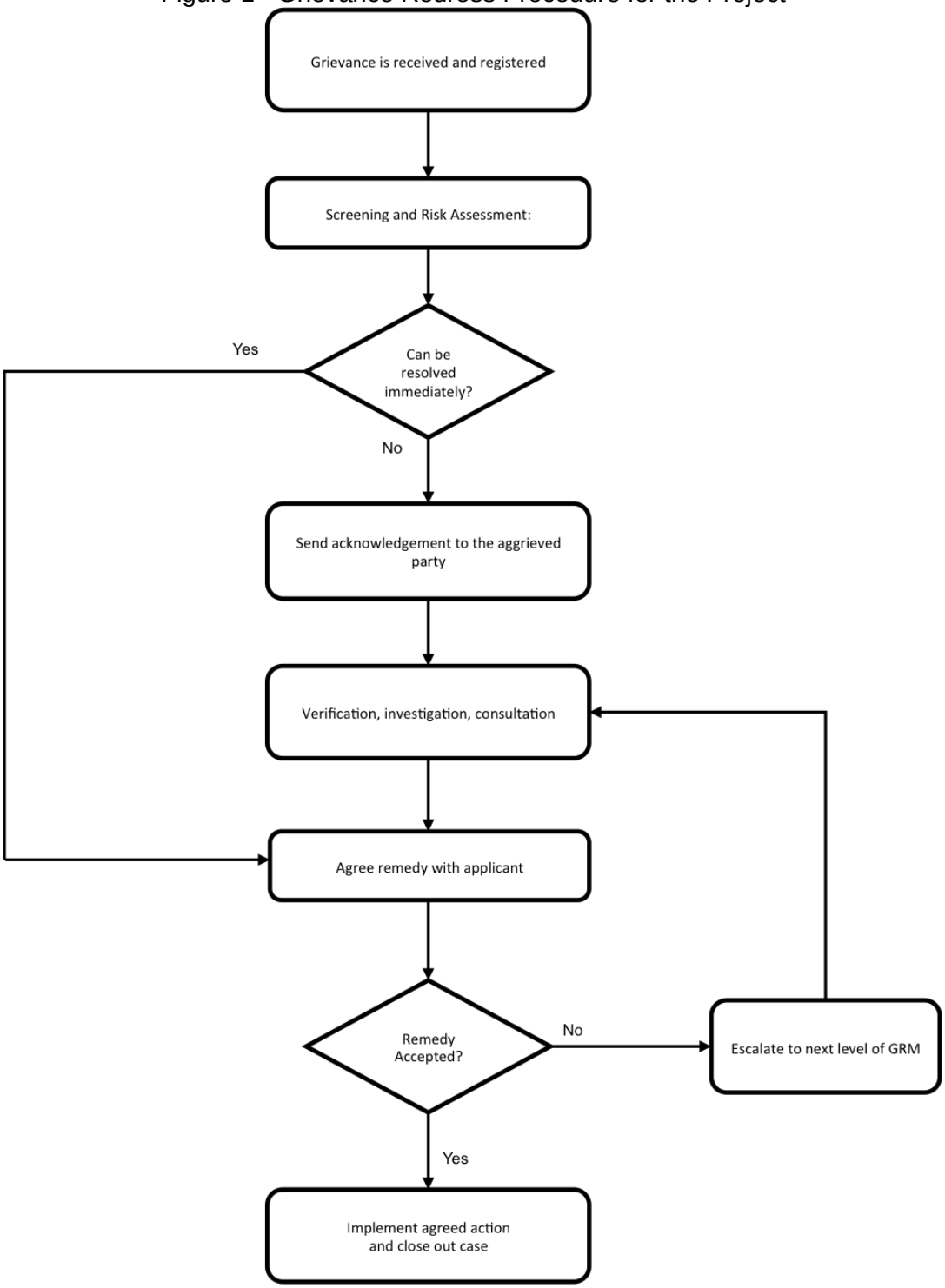


Table 15 Steps in the Grievance Redress Mechanism

Steps, Actions and Levels of Intervention				Duration
▼	ALDEIA AND SUCO COUNSIL			
1	Level 1 of the GRM includes the Aldeia and Suco Council (ASC) - An AP (complainant) may present a complaint to any of the following: the aldeia chief, the suco chief, a construction site supervisor, a contractor engineer, or a city project coordinator. Multiple points of entry for grievances are provided to ensure accessibility. The details of the complaint shall be recorded on a grievance form either by the AP or by the person receiving their representation; in case the AP is unable to fill out the grievance form due to low literacy, physical impairment or for any other reason assistance must be provided. Irrespective of who receives a grievance, the grievance form shall be submitted to the ASC to coordinate the investigation, assessment, and resolution. If the grievance cannot be resolved by the ASC within 2 working days, the ASC shall refer the case to the next level of the GRM. PMU/BTL will obtain records of all complaints from ASC to form the Project Complaint Register, and will support the ASC in determining the relevance of the complaint to the project activities.			5 days
	▼	PROJECT LEVEL		
2		Level 2 of the GRM is a Project Grievance Committee (PGC) chaired by BTL PMU, The PGC will consider the case and seek a resolution in consultation with the AP and the ASC. If the grievance cannot be resolved by the PGC within 10 working days, then PGC shall refer it to the next level of the GRM.		Further 10 days
		▼	CITY	
3			Level 3 of the GRM is the Grievance Redress Committee (GRC) chaired by Dili City MPW, with members from relevant government departments and representative(s) of a civil society organization, which is established by Dili City authority. The GRC will consider the case and seek resolution in consultation with the AP and the ASC. If the grievance cannot be resolved by the GRC within 10 working days, then GRC shall refer it to the next level of the GRM.	Further 10 days
			▼	NATIONAL
4				Level 4 of the GRM is the court of law. The court will register the case and provide a final decision which is binding to all parties	Open, but further 20 days
N-1: The shown days per step should be understood as a maximum duration.				
N-2: The grievance procedures are also applied for environment related complaints.				

9. REPORTING

76. Reporting requirements are in Table 16. The reports will provide enough information to ensure PMU is aware of progress and risks for environmental safeguards including health and safety. The monthly reports will contribute to the semi-annual environmental monitoring report to ADB, which will table all indicators measured with the monitoring plan of EMP including performance monitoring indicators and will include relevant national and international environmental quality standards.

Table 16 Reporting Requirements

Report	Frequency	Purpose	From	To
Contractor's progress report	Monthly	EMP and CEMP implementation progress and monitoring results	Contractor	PMU/BTL
Health and Safety compliance report	Monthly	Community and Occupational Health and Safety specific compliance and update including emergencies, accidents, incidents, complaints	Site Contractor EHS specialist	PMU/BTL
Environmental monitoring report (ADB's environmental safeguards monitoring report format)	Semi-annual	Full CEMP and EMP implementation and adherence to environmental covenants/conditions	EA	ADB

10. ENVIRONMENTAL MANAGEMENT PLAN COST ESTIMATE

77. The total cost for EMP implementation for the Project under the estimated Construction time (7 years) comprises the following:

- The cost of the mitigation measures is to be included in the construction contract budget – hence no additional cost for general design-related measures. However, there are mitigation measures for cultural "opening/closing" of sacred sites estimated at $5,000 (5 ceremonies at $1,000 for the 7 years);
- Contractor's EHS officer(s) including contractor's GRM focal point, for construction – this cost is included in the construction contract price and to be estimated by the contractor. The amount estimated for one EHS officer is $126,000 ($1,500/month for 84 months);
- The cost of environmental quality monitoring, detailed in Table 10, is to be included in construction contract budget – for construction this cost is estimated at $63,000 for a period of 84 months;
- EMP preparation, implementation monitoring and compliance monitoring, including public consultations (affected people and GRM) is covered under the project contracts and budgets e.g. PMC, hence no additional cost. The cost of institutional strengthening and technical training during construction is estimated at $40,800 (Table 7).

78. The overall cost of preparing and implementing the EMP including measures during construction and supervision is estimated to be approximately $236,200 (Table 17).

Table 17 EMP Estimated Cost for PA03 - Central for 7 years construction

	Particulars	Stages	Unit	Total Number	Rate ($)	Cost ($) 7 Years	Cost covered by:
A	**Mitigation Measures**						
1	Culture - Cultural "Opening" of project components and sensitive areas	Construction	Ceremony	5	$1,000	$5,000	Contractor
2	Contractor's EHS Officer	Construction	Person	1	$1,500 / month	$126,000	Contractor
	Subtotal (A)					**$131,000**	
B	**Environmental Monitoring Measures**						
1	Air Quality (if complaint at sensitive/residential location in ROW)	Construction	PM10 PM2.5	14	$1,500	$22,500	Contractor
2	Water Quality (if water present and complaint verified impact from project)	Construction	Annex 1 of DL31/2020	14	$500	$7,500	Contractor
3	Noise (if complaint at sensitive/residential location)	Construction	dBA	14	$1,500	$33,000	Contractor
	Subtotal (B)					**$63,000**	
C	**Institutional strengthening, technical training, consultation**						
1	EMP Development and Implementation	Before and during Construction	Training Session	2	$1,000	$2,000	PMC
2	Affected People Training	Before and during Construction	Training Sessions	15	$1,000	$15,000	PMC
3	Consultation with Affected People	Before and during Construction	Training and PC Sessions	29	$500	$15,000	PMC
4	Grievance Redress Mechanism	Before and during Construction	Training Session	2	$2,000	$4,000	PMC
5	Environmental Protection	Before Construction	Training Session	1	$1,000	$1,000	PMC
6	Environmental Monitoring	Before Construction	Training Session	1	$1,000	$1,000	PMC
7	WTP Operation and Maintenance - Environmental Safeguards	Once, prior to Operation	Training and on-the-job Sessions	6	$700	$4,200	PMC
	Subtotal (C)					**$42,200**	
	TOTAL (A+B+C)					**$236,200**	

79. 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 provisions is $20,000 over four years based on 100 workers and covers PPE such as hard hats, gloves masks, ear plugs, safety glasses, and safety boots.
- Clean up of spills from machinery maintenance cost and mobile noise barriers, which are included in the general overhead of the construction contractor.
- Remuneration and associated costs for the PMU and PMC as this is covered elsewhere in the overall project budget.
- Cost for the PMC which includes national and international environmental safeguards specialists.
- Deposition fee Cost for spoils from construction works landfilling in Tibar Landfill. These will need to be procured at Dili Municipality Sanitation Services.

80. The contractor will bear the costs for all mitigation measures during the 7 years of construction, including those specified in the tender and contract documents as well as those to mitigate unforeseen impacts due to their construction activities or resulting from corrective action plans issued to the contractor for EMP non-compliance.

11. CONCLUSIONS

81. Overall, the project is anticipated to bring environmental benefits to the populations of the project area, including in PA03 - Central. It will serve to improve the current water distribution situation and will provide long-term environmental improvements.

82. The most significant impacts from the project are expected to arise in the construction phase, especially in the distribution network construction. Negative impacts are anticipated to be of a low to moderate significance and short term, primarily during construction.

83. The contractor is central to managing construction impacts and also ensuring the project remains in compliance with ADB's requirements and national laws, by having a PMU approved site-specific CEMP and all national approvals in place before works commence.

84. The contractor will be required to actively engage in environmental safeguards through hiring qualified EHS staff, implementing the mitigation measures in the EMP, CEMP any further measures resulting from the domestic environmental assessment process by ANLA, swiftly managing any unforeseen impacts, and supporting the project with monitoring and reporting.

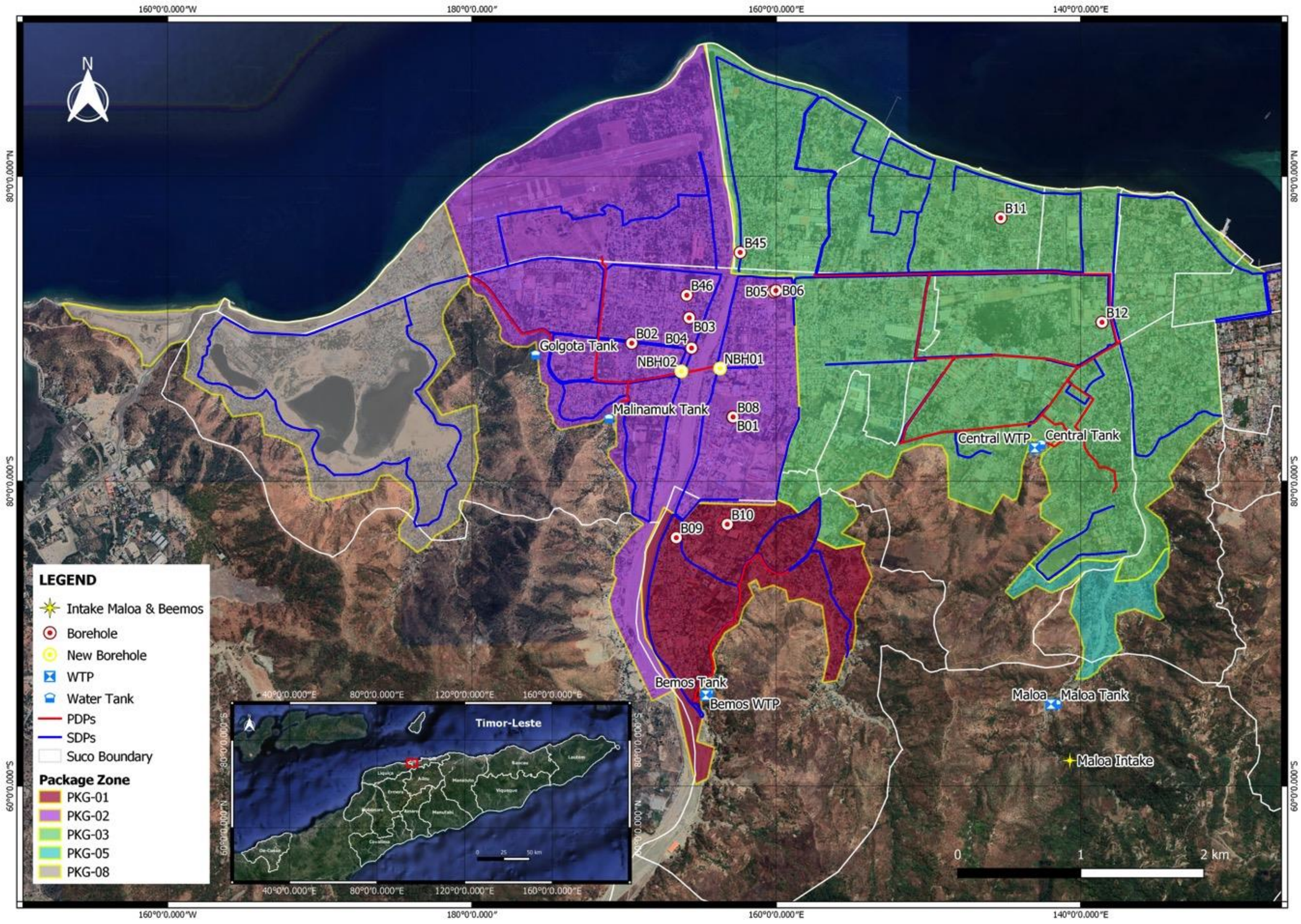
85. In general, the EMP, if implemented as directed, will mitigate impacts on the natural environment and affected people to an acceptable level. The key parties for mitigation measure implementation are the construction contractor and BTL, as the future operator. The implementation of this EMP will be closely monitored and reported on by the relevant functions in the project.

86. A robust GRM will be established, as outlined in this EMP. It will ensure that all unplanned impacts, which cause grievances to affected people, are managed swiftly with satisfactory outcome.

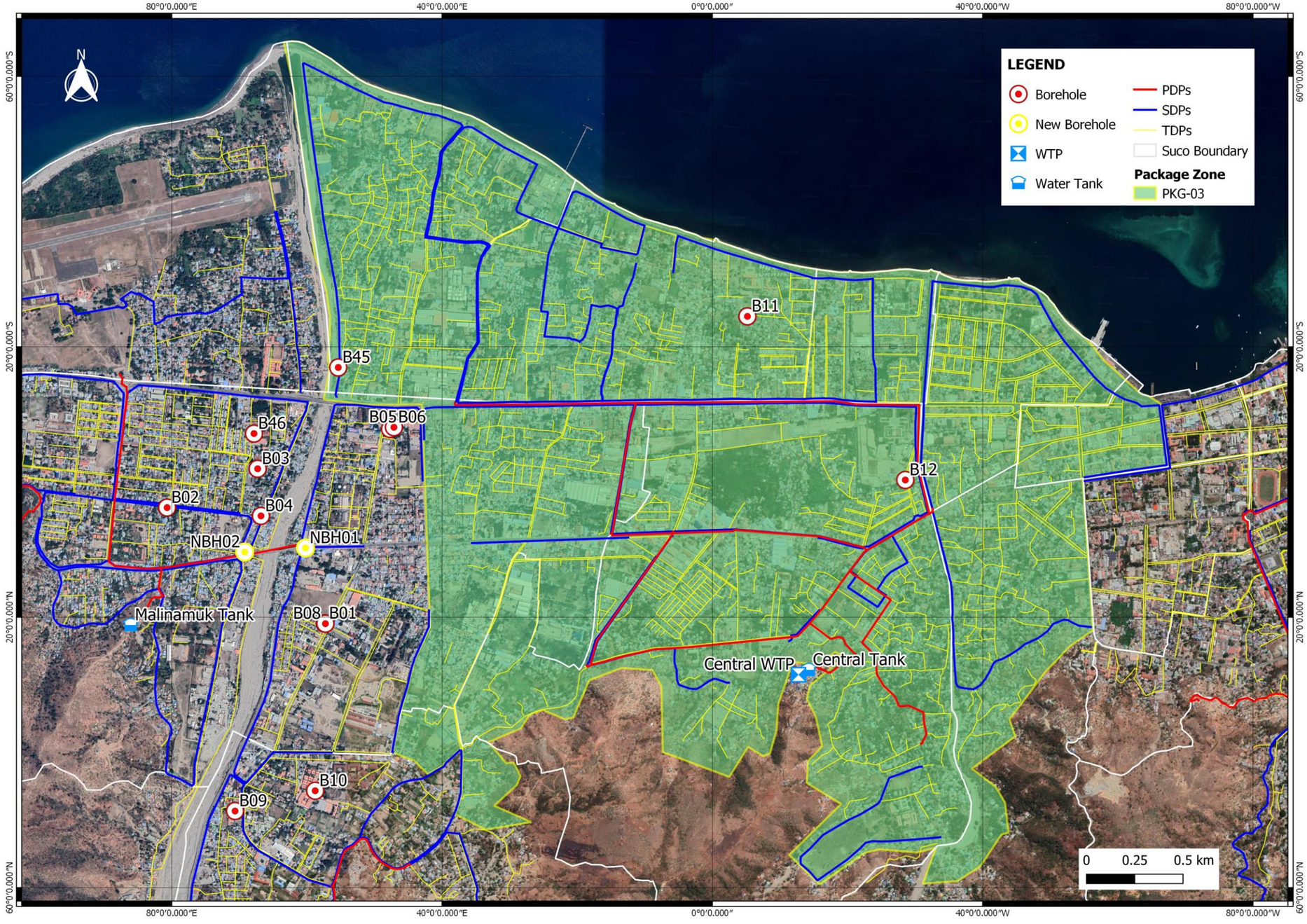
APPENDICES

Appendix 1. Project Location Maps

1.1 Location of the Project Components



1.2 PA03 - Central - Proposed Components



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Appendix 2. Guidance requirements for CEMP Mitigation Measures and Actions

1. The mitigation measures below are those identified in the EMP (identified as per their respective Mitigation Measure number), joined together as per the different component requirements listed in PC 0.4. Construction EMP.

2. The below mentioned is a list of (but not limited to) major actions and/or guidelines for each component reflected in the EMP and the IEE, to include in the CEMP structure.

3. The Contractor may complement these actions and measures with other actions and requirements (if required) based on best practice and experience, to guarantee that the CEMP provides for total environmental safeguarding of the project.

4. These mitigation measures are not the full CEMP but the basis for impact mitigation guidance for the relevant Package Area conditions and characteristics. The contractor will have to produce a CEMP based on international best structure and practice i.e., ADB EMPs, which will be reviewed and approved by the PMC prior to construction phase.

A. Sensitive Areas Management Plan

A.1) General Rules for Sensitive Areas and Fauna/Flora Species

a) PC 1.1.1.1. Contractor Improved Awareness with Sensitive and/or Protected Areas or Species

1) Guarantee contractor is trained, accepts, and follows all operational procedures applicable within these areas and/or species.
2) Contractor must not:
   - Move out from the established Project ROW, especially regarding proposed campsites. These locations must be approved by the Department for Protected Areas (DAP).
   - Kill, injure, damage, remove, handle, disturb or interfere with any endangered species or existing animals under any circumstances.
   - Bring domesticated animals on-site.
   - Poaching on-site or the surrounding forests.
   - Sell or buy endangered species or derivatives of these species.
   - Export endangered or derivatives of these species.
   - clear trees without DAP/Forest Guard inspection for nesting birds prior to cutting. The nest will be transferred carefully to another tree safe from project activities.
   - Carry out clearing of vegetation before a detailed layout of clearing is presented by the contractor and approved by the DAP.
   - Plant new/invasive species in the Project area, for reforestation purposes.

A.2) Vegetation Management

a) PC 1.1.1.2. Tree protection and/or felling procedures
   1) The contractor to carry out pre-construction visits to ROW alignments for identification, counting and approval of all common species trees proposed for felling. Contractor to review as follows:
      i) Common Trees
         - Check if Tree requires felling. Identification and approved marking of any vegetation if to be removed prior to clearance.
         - If not, protect during construction.
         - If felling is required, seek approvals from General Directorate for Forestry (Department of Protected Areas), with strict control on clearing activities to ensure minimal clearance.

- Define compensation measures, such as Replanting “1-for-1 to 10” (each common species tree felled) in areas requiring reforestation. Compensation tree numbers to be coordinated between BTL and DAP.

ii) Protected/Endangered Species of Trees

- Follow bullets 1 and 2 above in i) Common Trees
- If a protected/endangered tree requires felling, seek DAP felling approval and substitution numbers for planting of the same tree species (at a quantity to be determined).
- For sacred species i.e., "Ai-Hali", contractor must seek approval and agreement from the cultural leader or Lia-nain, SEAC, DAP and Biodiversity regarding approval for felling and tree substitution/compensation (as per National Directorate for Biodiversity guidance, replanting will require more effort from proponent, at a scale between 20 and 100 "-for-1” (each protected species tree felled).

B. Cultural Sites Safeguard Plan

PC 3.1.1.1. Prepare Cultural Sites Safeguard for each cultural site under risk and request license for each at the Cultural Directorate before construction commences.

a) Pre-construction, the contractor must:

1) review the immovable asset locations in the IEE and the EMP, together with the Secretariat of State for Arts and Culture (SEAC) team and identify any missing locations within the ROW..
2) Request SEAC for the approval of a License/authorization for intervention in the area of for each identified cultural sites <50m from project component, as per the rules mentioned in Decree Law No. 33/2017 for Cultural Patrimony Protection..

b) Construction Phase, the contractor must:

1) Make sure that sensitive heritage sites within 50 m radius of the construction activities should not be interfered with or impacted on, and the license rules are followed.
2) The sites will be demarcated to limit construction works outside the area and restrict access to the sites unless authorized by relevant authority.
3) In case a new cultural/historical heritage site is identified during the construction, the Contractor will notify the BTL and follow the same procedure regarding these sites.
4) If required, for Social and Cultural disruption due to Tara Bandu and Lulik/sacred or heritage sites (PC 1.2.3.1), involve lia na’in in cultural ceremonies i.e., “opening” for authorization to use cultural/natural water resource or protect any existing Lulik sites.
5) Precautionary measures will be taken by all construction workers to prevent damage to the sites.
6) Project activities during construction phase will be monitored by assigned personnel from the Culture Department.
7) If an accidental impact is done to any Lulik/Heritage sites, prepare the rehabilitation activity together with the Secretariat of State for Arts and Culture at the Municipal level.
8) After construction operations, the contractor shall seek clearance from relevant authorities that the sites are in their natural state prior to departure.

C. Campsite and Construction site Management Plan

These requirements are applicable for both Campsites and worksites or individually, where applicable.

a) General Requirements

1) PC0.4.2. The CEMP will include a map of each construction site, with copies held by the Contractor and BTL, showing as a minimum:
   i) Access routes.
   ii) storage areas for waste
   iii) storage area for chemicals such as fuels.
   iv) concrete mixing.
   v) stockpile storage areas (on & off site).
   vi) first aid kit and equipment used in emergency response.
   vii) location of worker camps (if required).

b) Location
1) C3.3.1.1. Establishment of work sites and camps on stable and flat surface area, and where it would not cause soil erosion.

c) Water and Sanitation Services
1) Drinking Water and Other
   i) C3.3.3.1. Establish a water tank and source water from BTL authorized sources.
   ii) C3.3.3.2. Purchasing sufficient potable water supply in the form of liter bottles or in gallons, for all construction staff throughout the duration of the construction activities.
2) Sanitation
   i) C3.3.2.1. Establishment of a Proper Latrine System
      - Installation of appropriate temporary latrine with Septic Tank for construction workers in the campsite, at least 30 m away from any water source.
      - For Construction Worksites, preferable portable toilets, if available.
   iii) C3.3.5.1. Implementation of Solid Waste Management System.
      - Minimize domestic waste production on site and implement reuse of waste where possible.
      - Immediate disposal of waste in designated bins/areas induced by the contractor.
      - Waste bins will be kept closed to prevent the accumulation of water during rain events.
      - Regular emptying of waste bins and transport to approved disposal sites i.e., Tibar Landfill, with coordination with local authorities of appropriate dumpsites.
      - Do not mix household waste with construction waste and place them into dustbins.

d) Storage and Handling Dangerous Materials
1) C3.3.4.1. Proper storage and handling of chemicals and dangerous materials
   i) Allocation of proper containments and labeled, suited for the nature of chemicals and/or waste will be provided by the contractor and maintained throughout the duration of the Construction phase.
   ii) Materials hauled directly to work front, minimizing storage at campsite.
   iii) If Fuel is required to be stored in a central depot, must be below smallest fuel storage volume requirement under the Law and placed on concrete slab or impermeable surface with bunding capable of containing at least a volume of one container, located within the central base camp.
   iv) C2.1.1.1. Provision and obligatory use of PPE for WTP/Tank Construction/commissioning chemical handling

v) Follow good practice guidance from international sources on chemicals handling and management includes UK Health and Safety Executive; Control of Substances Hazardous to Health guidance: https://www.hse.gov.uk/coshh/ Simple information on chemicals handling is available: https://www.hse.gov.uk/pubns/chemicals-poster.htm

vi) Good International Practice guidance on handling hazardous materials can be sourced from: IFC EHS Guidelines Hazardous Materials Management available: https://www.ifc.org/wps/wcm/connect/90231ba8-5bb3-40f4-9255-eaf723d89c32/1-5%2BHazardous%2BMaterials%2BManagement.pdf?MOD=AJPERES&CVID=nPtgwmI

2) Equipment and Vehicle Condition, Maintenance and Monitoring
   i) C3.5.1.1. Ensure all construction vehicles are in good condition and an acceptable state of repair before the start of the construction phase.
   ii) Prohibition of use of dilapidated equipment and vehicles with leaks and causing spills.
   iii) Equipment maintenance i.e., changing oil and lubricant cannot be done in the work site.
   iv) Equipment maintenance preferable to be done in licensed workshops that prove they have an approved waste oil management system.
   v) If maintenance in the Main campsite must be done if appropriate location with drip trays to be used when topping up / changing machinery fluids.
   vi) Accidental spills will be cleaned immediately and provision of drip trays to collect any oil or fluid drips.
3) Equipment Refueling
   i) Preference of refueling equipment and vehicles at licensed locations within the city.
   ii) If refueling at worksite, only temporary refueling volumes i.e., 200L Cans, etc., in designated suitable locations which are to be 50 m from a water source and drip trays to be used when refueling or topping up / changing machinery fluids.
4) Handling of Dangerous Waste
   i) Train/Inform workers/draft Guideline on identifying and risks of mishandling ACMs.
   ii) Contractor Environmental Specialist to confirm identified Asbestos Containing Materials (ACMs) i.e., pipes and construction materials
   iii) Prepare special team to identify, manage and dispose of ACMs from construction areas i.e., used pipes, in accordance with management plan to be included in the CEMP.
   iv) Coordinate with DNCP to determine final solution for ACMs.
   v) Waste Oil/fuel waste to be delivered at Tibar Waste Oil Plant, under Superior Environmental Authority (SEA), with documentation to prove delivery.

e) 3.5.4.1. Excavation procedures
1) Contractor operators Training sessions and daily construction planning in sensitive risky areas.
2) Provide engineering procedures and equipment to avoid landslides and/or rock-falling in risky areas.

3) Excavations will only be started once all required materials and services are on their allocated sites and a layout already established for the transport of materials.
4) Excavations, cuttings and fillings will be carried out in a manner to reduce soil erosion and avoid material falling (see also 3.5.2.) and take the following precautions:
   i) Proper backfilling trenches.
   ii) Earthworks targeted for dry season as soil erosion vulnerability is high during wet season, thus, stockpiles (sand, cement and aggregates) will not be situated at or near steep areas.
   iii) Exposed soil will be stabilized and re-vegetated to prevent further soil erosion.
   iv) Where access is impeded, provide for temporary passageways and communicate/inform dwellers and institutions.
5) Set up adequate demarcations/barriers and establish visible warning signs in excavated, cut and filled areas for safety precautions (pedestrians and traffic), especially no entry zones in Hillside excavations i.e., Tank Malinamuk, Golgota and Be'e mos and Maloa WTPs, to avoid entrance of unauthorized persons into dangerous areas.
6) Use of well trained and experienced machinery operators to reduce accidental damage and risky situations.

f) Noise Management

1) C3.5.5.1. Implementation of Noise Management Controls.
   i) Implementation of working hours (permissible working activity only from 7 AM to 7 PM).
   ii) Limit contractor equipment and vehicle speed to 40Km/h within Package Area. iii) Use of power horns is banned.
   iv) Queuing and idling of construction vehicles outside the premises of the camp site and outside operating hours specified is prohibited.
   v) Dissemination of information to the community on the construction works times and activities.

g) Air Quality and Dust Management

1) 3.5.6.1. Implementation of Air Quality and Dust Management Controls.
   i) Watering of surface through water truck, sprinklers or hoses, 2-3 times a day, particularly during dry season and high traffic volume, when near residential or built-up areas, or whenever required due to inspection and/or GRM complaint.
   ii) Dump trucks transporting raw materials to and from the site shall be covered by tarpaulins, or other acceptable types of cover.
   ii) Keep a detailed log of incidents when excessive visible dust emissions occur, the actions taken, and an approximate rate of water application noted.
   iii) Covering of stockpiles during periods of high wind.
   iv) Minimize movement of heavy vehicles and Limit velocity to 40 km/h in residential and 50 Km/h maximum in urban area.
   v) Due attention to sensitive receptors (incl. Markets, Schools, Housing areas). Position any stationary emission sources (e.g., portable diesel generators, compressors, etc.) 100 m away from sensitive receptors.
   vi) Daily cleaning of road surfaces of debris/spills from construction equipment, haulage trucks and vehicles.

h) Resources Management

1) 3.4.1.1. Sand and Stone Sourcing Management

i) Source all new materials from licensed companies/suppliers under the National Authority for Petroleum and Minerals Authority.
ii) Weekly supervision to allow regulating the source of the materials, ensure good condition of the extraction sites and assure quantities of materials conform to project specifications, to reduce the generation of spoils in the construction site.

i) Site Clean-up

1) 3.6.1.1. Site Clean-up Measures
   i) All temporary structures, materials, waste, and facilities used for construction activities will be removed and disposed of correctly upon completion of the project.
   ii) Excess rocks and sand as a result of excavation activities are to be disposed of as per 3.5.3.1. prior to departure.
   iii) Latrines and septic tanks will be covered with dried plant matter and soil mix prior to departure.

D. Spoil and Demolition Waste Management

The following general rules must also be complemented with Appendix 7 contents:

a) C3.5.3.1. Spoils and Stockpiles Handling and Storage Plan

1) All stockpiles to be situated within the campsite or designated areas on-site that can easily be accessed by equipment and personnel and will cause minimal interference to the movements of vehicle and personnel in the project site. Identify stockyard areas in consultation with local administration, if not in base camp.
2) Cover stockpiles with impermeable material like plastic, to protect from wind and rain events.
3) Reuse excess spoils and materials at all times, preference must be given to use of spoil in other BTL construction sites, or, if extra but good quality, option of delivery to existing commercial quarry companies for retreatment and reuse.
4) Uncontaminated spoil to be disposed of in Government approved sites, but CANNOT not be on agriculturally productive land, within 50m of a water course, including stream, river or irrigation channel, on sloped land, within 50 m of cultural heritage sites, within 100 m of any other culturally or ecologically sensitive feature.
5) As a last option, send spoils to Tibar landfill, if approved by Dili Municipality
6) Trucks transporting spoils shall be tightly covered with tarpaulin or other suitable materials to minimize dust emission and spills.

E. Community and Occupational EHS and Emergency Response

a) C3.2.1.1. General Health and Safety Measures

1) Definition of Contractor EHS representative.
2) Toolbox meeting.
3) Train and conduct orientation for all workers and site personnel on environmental health and safety.
4) Catalogues, manuals and EHS signage shall be provided in Tetum translation.
5) Provide personal protective equipment to workers and ensure their effective usage.
6) Make first aid kits readily available.
7) Maintain accident reports and records.
8) Ensure moving equipment is outfitted with audible backup alarms.
9) Distance the community from physical, chemical or other hazards associated with sites under construction and decommissioning (including

COVID-19 related prevention and reaction (see G. COVID-19 Management Plan).

10) Implement a HIV/AIDS awareness program as part of the occupational health and safety training provided to personnel on the project.

F. Traffic Management Plan

a) C3.3.2.1. Prepare a Traffic management plan that includes:

1) Planning:
   i) How the contractor will inform the community and businesses of construction traffic routes.
   ii) Any advice/information the contractor will give to affected people during construction.
   iii) How the contractor will manage traffic including any road closures.
2) Implementation:
   i) Trained traffic marshal will be used to direct vehicle movements on and around construction sites and in all urban areas.
   ii) Disseminate information to the community on Safe Traffic during Construction
   iii) Contractor responsible for maintaining uninterrupted access by always keeping at least one lane open.
   iv) Speed limits will be determined for vehicles, below 50 km/hour per hour in city area and <40 km/hour in residential areas.
   v) Provide warning signs indicating the works with 500 m distance from worksite.
   vi) Provide signals and/or flag controls, adequate lighting, fencing, signage and road diversions.
   vii) Regularly monitor traffic conditions along access roads to ensure that project vehicles are not causing congestion.

G. COVID-19 Management Plan

a) C3.3.7.1. COVID-19 Construction site and Work Site Management mitigation measures

1) COVID-19 Planning and Preparation
   i) Plan and execute work in compliance with country-specific COVID-19 risk management regulations and directives including directions of the General Department of Labor, Secretariat of State of Labor, and Vocational Training.
   ii) Risk communication, training, and education. Training of workers in infection prevention and control practices.
   iii) Conduct workplace risk assessment to identify low, medium, or high exposure risk to COVID-19. Include an action plan for prevention and mitigation of the spreading of COVID-19.
   iv) Health surveillance and insurance.
   v) Consider other hazards, including psychosocial.
   vi) Review emergency preparedness plans.

2) COVID-19 Measures Implementation
   i) Follow Appendix 2 recommendations for campsite and worksite COVID-19 management.
   ii) Provide clear and visible guidelines on how to prevent infection at the construction site and initiatives taken.
   iii) Adopt engineering, organizational, and administrative measures, plan work so employees can keep distance from each other and minimize contact.

iv) Promote personal hygiene (including hand and respiratory hygiene), make washbasins and sanitizers available at entry, break area, and washrooms.
v) Provide PPE and inform workers of its correct use.
vi) Regularly clean and disinfect.
vii) 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.
viii) Review and update preventive and control measures as the situation evolves and Involve workers/ occupational EHS groups in the review.

Appendix 3. COVID-19 Protection and Mitigation Measures

1 Construction Site Working Conditions Mitigation Measures for COVID-19	
1. Resources	• Nominate a staff member with responsibility for COVID 19 measures on site. • Develop and communicate a work plan on safe working for COVID-19. Such plan should be fully aligned with any government regulations and guidelines on COVID-19 prevention and control, or in the absence thereof, with international good practice guidelines as may be updated from time to time.
2. Beginning work	• Ensure preventative measures are in place before beginning construction work.
3. Adopt engineering, organizational, and administrative measures	• Avoid physical interaction and maintain physical distancing requirements as prescribed by national policy, or in the absence thereof, international good practice. • Ventilate enclosed workplaces including work camps and communal spaces. • Avoid concentration of workers - limit the capacity of common areas such as work camp dining rooms and changing rooms to allow the minimum separation of 2 m and organize one-way systems. This includes sleeping areas, which must be a minimum of 2 m between beds. • Put in place training and information on COVID-19 and measures required for its management. • The construction site is to be segregated to the extent possible in zones or other methods to keep different crews physically separated at all times. • Stagger break and lunch schedules to minimize the number of people in close proximity to one another.
4. Regularly clean and disinfect	• Increase the frequency of cleaning and disinfection, in particular heavily trafficked areas and common areas, including work camps. • All door handles, railings, ladders, switches, controls, eating surfaces, shared tools and equipment, taps, toilets, and personal areas are wiped down at least twice a day with a disinfectant. • Discourage the sharing of items such as cups, glasses, plates, tools.
5. Promote personal hygiene	• Provide workers with the conditions and means necessary for frequent hand washing (soap, water, or alcohol gel) with a posted hand washing protocol at site entries, exits, bathrooms, communal areas, offices, and any other areas with commonly touched surfaces. • Inform workers of the need to avoid physical contact when greeting, and avoid touching eyes, nose and mouth. • Inform workers of the need to cover the mouth and nose with a disposable handkerchief when coughing or sneezing or the crook of their arm. • Dispose of tissues in a lined and covered waste bin and wash hands afterwards.
6. Provide PPE and inform workers of its correct use	• Identify appropriate PPE related to the tasks and health and safety risks faced by workers according to the results of risk assessment and the level of risk and provide it to workers free of charge and in sufficient number, along with instructions, procedures, training and supervision. • Non-medical face-coverings (such as homemade cloth masks) should be worn as mitigation for catching and transmitting the virus but are not to be treated as substitutes for proper hand washing.

1 Construction Site Working Conditions Mitigation Measures for COVID-19	

7. Health surveillance and insurance	• Before entering the site, staff and visitors must confirm that they are not currently exhibiting flu-like symptoms.
	• Monitor the health status of workers and develop protocols for cases of suspected and confirmed COVID-19. The protocol will state that:
	  ◦ Workers with symptoms or confirmed cases must be isolated within the construction camp or stay at home for 7 days after symptoms started.
	  ◦ If symptoms persist after 7 days the person must isolate until the symptoms stop.
	  ◦ People who have been in close contact with the person with confirmed COVID-19 be quarantined for 14 days or in compliance with national health recommendations.
	• All workers in quarantine or isolation must be provided with adequate food, water, medical assistance, and sanitation.
	• Identify workers who have had close contact with people infected with COVID-19 and follow national medical guidance.
	• Communicate confirmed cases of COVID-19 infection to the appropriate authorities.
	• All workers should be provided with health insurance that includes COVID-19 treatment

8. Consider other hazards, including psychosocial	• Promote a safe and healthy working environment free from violence and harassment. • Encourage health promotion and wellbeing in the workplace through enough rest, balance of physical and mental activity and adequate work- life balance. • Implement prevention and control measures for the use and storage of chemicals, particularly those used for disinfection during COVID-19.
9. Review emergency preparedness plans	• Develop an emergency plan adapted to COVID-19 and regularly review it.
10. Review and update preventive and control measures as the situation evolves	• Periodically monitor prevention and control measures to determine whether they have been adequate to avoid or minimize risk and identify and implement corrective actions for continuous improvement. • Establish and maintain records related to work-related injuries, illnesses and incidents, worker exposures, monitoring of the work environment and workers' health.
Source: Adapted from: ILO, WHO, Canada Construction Association, and UK Government. For up to date information on COVID-19 see World Health Organization (WHO): https://www.who.int/emergencies/diseases/novel-coronavirus-2019	

2. Worker Camp Siting and Management Mitigation Measures for H&S and COVID-19	
1. Siting	• Not in area liable to flooding, landslide or other natural disaster • Not in area affected by construction dust, noise, sewage, or other pollution • Not in a residential area.

2. Worker Camp Siting and Management Mitigation Measures for H&S and COVID-19	
2. Minimum housing standards	• A separate bed for each worker • Beds should not be arranged in tiers of more than 2. • Separate accommodation of the sexes or to accommodate couples. • Adequate natural light during the daytime and adequate artificial light. • Adequate ventilation to ensure sufficient movement of air. • Adequate supply of safe potable water. • Adequate sanitary facilities (see below). • Adequate drainage. • Adequate furniture for each worker to secure his or her belongings, such as a locker. • Common dining rooms, canteens, or mess rooms, located away from the sleeping areas. • Appropriately situated and furnished laundry facilities. • Reasonable access to plug sockets for charging telephones and other devices. • Rest and recreation rooms and health facilities, where not available in the community.
3. Minimum accommodation sizes	• Sleeping space. • Inside dimensions over 198 cm by 80 cm; sleeping room. • headroom of over 203 cm allowing full free movement. • Beds minimum 2 m apart for COVID-19 risk management.
4. Sanitation Facilities	• One toilet, one tap / basin, one toilet for every 6 people. • Convenient location to accommodation. • Provision of soap. • Separate facilities for men and women. • Ventilation to open air. • Fresh cold running water. • Clean and hygienic. • Septic tank / sewage treatment facility, or pit latrines located at least 200 m from surface waters, and in areas of suitable soil profiles and above the groundwater levels
5. H&S within worker accommodation	• Separate area for sick workers to prevent transmission of disease. • Smoke detector in sleeping area. • Fire safety throughout accommodation such as fire extinguishers, fire alarms, fire blankets. • Worker training in fire prevention and procedures. • Fire exit sign, adequate means of escape and clearly maintained exit. • Security lighting within camp and for sanitation block and lighting for route from sleeping area to sanitation block. • Electrical cables to be in safe condition, elevated and not in areas liable to flood.
6. Inspection	• 2 weekly inspections to inspect for cleanliness, state of repair of building, accommodation, and fire equipment. • Record inspection results and retain for review.

Appendix 4. Asbestos Containing Materials Mitigation Measures

Guidelines:

As there are no direct guidelines under Timor laws and regulations on ACMs refer to international standards and guidelines:

- US Environmental Protection Agency, Asbestos page: http://www.epa.gov/asbestos
- WHO Occupational health publications, asbestos: http://www.who.int/occupational_health/publications/asbestosrelateddiseases.pdf
- ADB's Good practice guidance for the management and control of asbestos: https://www.adb.org/publications/good-practice-management-control-asbestos
- East Timor Transition Administration, in cooperation with AusAid "Guidelines on Maintenance, Handling and Disposal of Asbestos Materials and Asbestos Waste." September 2000.

Management and Mitigation Measures:

1. Asbestos Register (see example below)	Before physical works starts on any existing structures (such as WTP, reservoirs, any visible pipe network), the Contractor, in conjunction with BTL will visually survey the structures for asbestos containing materials (ACM). Any potential sites containing ACM will be recorded in an Asbestos Register, to be held by BTL. The Asbestos Register will contain the following information: • Date asbestos was identified • Specific location (within the structure surveyed) • Detailed description of material (including surface treatment, color, purpose e.g. flooring) • Bonded or Unbonded? • Condition of material (friable, good condition, loose pieces) • Likelihood of disturbing the material? (e.g. during maintenance or using the building)
2. Asbestos Management	When identified in the Asbestos Register if ACM cannot be avoided or if ACM is discovered during construction the following measures will be implemented.
	ACMs must be handled under controlled conditions (with gloves, mouth and eye protection and under moist conditions so as to not break the materials and risk inhalation. The contractor must coordinate with the National Directorate for Pollution Control on solution for deposition of these materials. The CEMP must include ACM mitigation measures as described below as a minimum, to detail how to identify, remove, and safely dispose of ACMs, when ACMs are identified:
	1) First confirm ACM status. Send a carefully extracted and properly wrapped sample to an approved laboratory for testing. If a laboratory is not available, the assumption must be that the material is ACM. 2) Cordon off the area, control access, and provide clear signage of the ACM risk. 3) Provide all staff with correct PPE: • Clothing -> personal protective clothing to prevent skin

	contact and cover hair/ long sleeve + disposable. • Respirator -> min P3 respirator, or N95 Dust mask. • Goggles, gloves and safety boots. 4) Identify, mark, delineate the ACM that will be removed and do-not mix ACM with non-ACMs. 5) Avoid cutting or breaking ACMs if possible. If cutting is required wet the ACM surface and add duct tape and wet the material with a water spray to reduce the risk of dust generation. 6) Supervision + Sampling material (if any left), make sure all asbestos material has been removed. Ensure the site is free of dust and debris which may contain asbestos e.g. wash with wet cloths and dispose of the cloths as ACM. 7) Removed asbestos must be contained, double wrapped, and sealed, and placed into removal bags or bins and labeled. Use only durable container: double bag polythene, drum, or bin. 8) Asbestos waste should not be disposed of with other wastes. In countries where asbestos use is regulated, there will be special or hazardous waste disposal facilities. If special facilities are unavailable, asbestos waste should be sealed in double lined bags and disposed of at a secured waste site and kept separate from other types of waste. Work with the local government to identify a suitable and safe site and ensure that a record is kept of the location. If Asbestos is properly contained, buried, and remains undisturbed it will remain safe and pose no further environmental or health risk. 9) Update the Asbestos Register to show the ACM has been removed. 10) Decontaminate equipment after use. A dedicated decontamination area is required close to the work area, separating the contaminated and clean materials and equipment. The contaminated area should have provision of storage of contaminated clothing and footwear in a labeled container. A shower or washing facilities are required for all personnel involved in ACM removal.

Asbestos Register:

The following information is recommended for an asbestos register:

Asbestos Register for: [Facility/site name]					
Date asbestos was identified	**Specific location**	**Detailed description of material** (including surface treatment, color, purpose, size)	**Bonded or Unbonded**	**Condition of material** (friable, good condition, loose pieces)	**Likelihood of disturbing the material?** (during maintenance or site use)
21-June-22	WTP Roof	Corrugated roof sheets, unpainted	Bonded	Poor condition, crumbling in places	Low during WTP maintenance and site use
21-June-22	Behind main	Insulation	Unbonded	Good	High likelihood

	generator on wall	board, 2m^3 sheet		condition	of damage during generator repair
21-June-22	Water pipe leading to Northeast from intake X	Pipe estimated 300m long, 80mm diameter	Bonded	Mostly good, some deterioration in places	High during network maintenance

Appendix 5. Affected Person Monitoring Form

Consultation / Interview Form

Date of Interview		Name of Interviewer	
Interview site: *Where is the interview held? In school, on the road, in shop?*		**Stakeholder name and status:** *Full name, status is business owner, schoolteacher, religious leader, resident*	
Construction site and date construction started *Which road, GPS location if available*		**Has this stakeholder been interviewed before?** *Yes/No (if yes, when were they interviewed?)*	

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 to make?	
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*	

If dust or air pollution from the construction is a problem, what changes does the person suggest are made?	
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 or easier, more / 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. *Which water source; groundwater and/or surface water? How was it polluted?*	
During the project, is the person affected by water pollution? If yes, explain how and when. *Which water source; groundwater and/or surface water? 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? What is the nature of the effect and how does it affect the business?	
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, labor force,*	

Appendix 6. Complaints Registry Form

BEE TIMOR-LESTE, EMPRESA PÚBLICA
BTL, E.P.
Avenida 20 de Maio, Caicoli, Dili Timor-Leste Caixa· Postal No· 194, Telp· 3311539

FORMATU KONSEPTUAL BA MEKANISMU REPARASAUN KEIXA **CONCEPTUAL TEMPLATE OF GRIEVANCE REDRESS MECHANISM (GRM)**				
Numeru Keixa/ Grievance Number				
Naran Rekorda / Name of Recorder				
Data simu / Date Received				
Data Gravado / Date Recorded				
Informasaun Sobre Keixa / Information About Grievance				
Defini Kazu Ou Keixa / Define The Grievance				
Informasaun Sobre Reklamante (karik prontu atu fornese no publika) / **Information about the Grievant (if willing to provide)**				
Naran / Name				
Numero Telemóvel / Phone Number				
Hela Fatin / Address				
Defini Assaun Immediata e Necessaria/ Define Immediate Action Required				
Assaun Korektivu Corrective Action	Partes Relavante Konsultadas Parties Relevant Consulted	Data Taka Due Date	Responsavel Responsible by	Verifikasaun Assaun Korektivu e Assina Verification Corrective Action and Sign off
Define Long Term Required (If Necessary)				
Assaun Korektivu Corrective Action	Partes Relavante Konsultadas Parties Relevant Consulted	Data Taka Due Date	Responsavel Responsible by	Verifikasaun Assaun Korektivu e Assina Verification Corrective Action and Sign off
Taka ba Keixa ou Reklamasaun / Grievance Closeout				
	DATA/ DATE		**ASSINATURA/ SIGNATURE**	
Data Responde Verbal ba Reklamante/ **Date Verbal Response Provide to Grievant** Data Responde Formal ba Reklamante/ Date Written Response Provide to Grievant Konfirma Receivu ba Resposta nian/ Confirm Receipt of Response Konfirma Taka / Confirm Closeout				

Appendix 7. SPOIL and Demolition Waste Management Plan

A. Spoil and Demolition Waste Management Plan

The Plan describes how the contractor will manage the generated spoil and solid waste including demolition waste, related to design and construction activities. This is an integral part of EMP.

1. Objectives:

- To minimize spoil generation.
- To maximize beneficial reuse of spoil and demolition waste from construction and demolition activities in accordance with spoil and waste management hierarchy.
- To minimize environmental impacts on resident and other receivers.
- Minimize and/or avoid any further site contamination of land, water and soil.

2. Structure:

Section 1: Introduction
Section 2: Legal and other requirements
Section 3: Roles and responsibilities
Section 4: Identification and assessment of spoil aspects and impacts
Section 5: Spoil volumes, characteristics and minimization
Section 6: Spoil and demolition waste reuse opportunities, identification and assessment
Section 7: On site spoil and demolition waste management approach
Section 8: Spoil and demolition waste transportation methodology
Section 9: Monitoring, Reporting, Review, and Improvements

3. Aspects and Potential Impacts:

Aspects	Potential Impacts
Air Quality	Airborne dust generation due to wind
Sedimentation	Sediment laden site runoff from spoil stockpiles and spillage of spoil from truck on roads
Surface and Groundwater	Contamination of water quality
Noise	Temporary duration associated with spoil handling, haulage and storage
Traffic	Associated with spoil haulage
Land Use	Spoil being transported to a receivable site that doesn't have space for disposal or if to a location that doesn't have permission for disposal

B. Spoil Volumes, Characteristics and Minimization

1. **Spoil Volume Calculations.** Estimate the volumes of spoils produced from each of the construction sites.
2. **Characterization of Spoil and Demolition Waste.** Based on the type of spoil (sand, stone, mix materials, reusable materials) and if they are contaminated or not.
3. **Adopt Spoil and Demolition Waste Reduce, Reuse Opportunities.** An overview of the assessment methodology to be used:
    a. Consideration of likely spoil and demolition waste characteristics
    b. Identification of possible reuse sites
    c. Screening of possible reuse opportunities

4. **Identification of Possible Safe Disposal Sites for Spoil and Demolition Waste.** Those spoils and wastes which can't be reused and are not contaminated shall be

properly disposed in designated areas; such disposal areas should be identified in project locations. Such disposal areas should be safe from environmental aspects and there should be any legal and resettlement related issues. Such areas need to be identified and prior cliental approval should be obtained to use it as spoil disposal area. The local administration must be consulted and if required permission should be obtained from them.

C. Storage and Stock Piling

1. **Stockpiling.** Spoils shall be stockpiled at locations at least 300 m away from water courses and covered.
2. **Transportation and Haulage Route**. Based on the above, the contractor will have to prepare a transport and route plan, and submit it to the consultant for review and approval.

Appendix 8. Particular Conditions (for Bidding Documents)

The following clauses shall be added to the Bidding Document, Section 8 Particular Conditions in relation to the Environmental Safeguards for the Project:

The contractor will undertake to develop and submit to the PMU/PMC for approval, a site-specific Construction Environmental Management Plan (CEMP) with the following management sub- plans:

A. Sensitive Areas Management Plan
B. Cultural Sites Safeguard Plan
C. Campsite and Construction site Management Plan (if required)
D. Spoil Management Plan
E. Community and Occupational Environment Health and Safety and Emergency Response
F. Traffic Management Plan
G. COVID-19 Management Plan

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.

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.

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.