Initial Environmental Examination

PUBLIC

May 2024

Tuvalu: Funafuti Water Supply and Sanitation Project

Prepared by EGIS/Scope Consultants in coordination with the Funafuti Water and Sanitation Project – Project Management Unit, the Water and Sanitation Division of the Public Works Department of the Ministry of Public Works, Infrastructure Development, and Water, the Climate Change Department of the Ministry of Home Affairs, Climate Change, and Environment, and the Department of Lands of the Office of the Prime Minister for the Asian Development Bank (ADB).

CONTENTS

CURRENCY EQUIVALENTS

(as of 9 April 2024)

Currency Unit	–	Australian dollar (A$)
A$1.00	=	$0.66
$1.00	=	A$1.51

ABBREVIATIONS

ADB	–	Asian Development Bank
APs	–	Affected Persons
CBDRM	–	Community-Based Disaster Risk Management
CSOs	–	Civil Society Organisations
EA	–	Executing Agency
ESU	–	Environment and Social Unit
DoL	–	Department of Lands and Survey, MNRD, GoT
FK	–	Funafuti Kaupule (Funafuti Town Council)
FWSSP	–	Funafuti Water Supply and Sanitation Project
GCMs	–	Global Climate Models
GIS	–	Geographical Information System
GoT	–	Government of Tuvalu
HSP	–	Health and Safety Plan
IA	–	Implementing Agency
IEE	–	Initial Environmental Examination
km	–	kilometer
km^2	–	square kilometer
m^2	–	square meter
m^3	–	cubic meter
MFED	–	Ministry of Finance and Economic Development, GoT
MNRD	–	Ministry of Natural Resources Development, GoT
MPWIDW	–	Ministry of Public Works, Infrastructure Development, and Water, GoT
NGO	–	Non-Governmental Organization
NISC	–	National Infrastructure Steering Committee
O&M	–	Operation and Maintenance
PAM	–	Project Administration Manual
PMU	–	Project Management Unit
PRF	–	Project Readiness Financing
PWD	–	Public Works Department, MPWIDW, GoT
RO	–	Reverse Osmosis
RP	–	Resettlement Plan
RWH	–	Rainwater harvesting
SPS	–	Safeguards Policy Statement
SPREP	–	Secretariat of the Pacific Regional Environment Programme
TA	–	Technical Assistance
TKIII	–	National Strategy for Sustainable Development
ToR	–	Terms of Reference
USD	–	United States Dollar
WSD	–	Water and Sanitation Division, PWD, MPWIDW, GoT

NOTE

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

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EXECUTIVE SUMMARY

This Initial Environmental Examination (IEE) has been prepared by the consultant team engaged under Grant-6301 TUV: Funafuti Water and Sanitation Project – Project Readiness Financing (PRF) to prepare the proposed Funafuti Water Supply and Sanitation Project (FWSSP). Both the PRF and the proposed FWSSP are administered by the Government of Tuvalu (GoT) with funding from the Asian Development Bank (ADB).

The PRF has developed concept designs of water supply and sanitation services improvement sub-projects under proposed Outputs 1 and 2. These sub-projects are the core components of the FWSSP and include

i) Central Business District and all urban areas of Funafuti – piped water supply network; new reverse osmosis (RO) desalination plant; two elevated reservoirs;

ii) North Lofeagai – construction of new septage drying beds, wastewater treatment plant and a dispersed ocean outfall and installation of three (3) septic tanks, as pilot; repair sanitation facilities at school and health center; and

iii) Procurement packages – in particular, supply of rainwater harvesting and storage materials for outer islets (Papaelise, Amatuku and Funafala islets).

These components have been selected from a Water Supply Master Plan for Funafuti and a Sanitation Master Plan prepared under the PRF Phase 1 feasibility study. Phase 2 (designated as the detailed engineering phase) of the PRF study is yet to be undertaken.

Initial Environmental Examination (IEE) report was developed for Components 1 and 2 during this PRF study. This IEE is prepared to provide consistent and appropriate environmental standards for urban infrastructure subprojects during the implementation of the FWSSP.

The proposed project is classified as category B under ADB's Safeguards Policy Statement (SPS) 2009 for its potential environmental impacts. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be readily designed.

The GoT's environmental impact assessment (EIA) requirements as outlined in the Environmental Protection Act 2008 – EIA Process and the EIA Amendment Regulations 2017 have also been considered during this IEE of the core components and must be approved by GoT before project construction commences. These documents have been provided at Appendix A.

This IEE is to provide a framework to review and assess environmental aspects of activities undertaken within the project, including pre-construction, construction, and operational phases. It will provide an overview of the subprojects to be assessed, and place this within the context of the national environmental assessment and review procedures in Tuvalu. At all times, ADB's SPS will be followed. Consultation mechanisms, and environmental monitoring and reporting will also be addressed within this framework to ensure ongoing adherence to environmental safeguards.

The preparation of this IEE was carried out with PWD/WSD, together with advice from the Department of Environment, to identify the proposal to build a public water supply piped network with customer service connections throughout the Funafuti urban area and to improve the security, safety, and public health aspects of sanitation through this urban area through improved septage waste treatment and disposal.

The project aims to improve water and sewage services in Funafuti. The water supply subproject includes (i) design and construction of two new reinforced concrete elevated raw water storage reservoirs with an estimated capacity of 240 m^3; (ii) design and construction of a raw water pump station at Public Works Department (PWD) Headquarter compound and supply pipelines to both elevated reservoirs; (iii) renovation and refurbishment of the old RO desalination plant room at PWD Headquarter and; (iv) design and construction of the piped water distribution network of approximately 400 metered connections across the seven villages of Funafuti. The subproject also includes plant and equipment as follows: (i) RO seawater desalination plant with capacity estimated at 200 m^3/day; (ii) new water supply and plumbing service vehicle; and (iii) household and commercial customer meter/connection field testing equipment.

The sanitation subproject includes (i) design and construction of ten septage drying beds; (ii) design and construction of a five kl per day packaged sewage treatment plant; (iii) design and construction of a piped sewage effluent ocean outfall manifold pipe; and (iv) renovation and repair of sanitation facilities in Government buildings including health centers and schools. The sanitation subproject also includes plant and equipment (i) truck mounted septage vacuum pump-out tanker with an estimated capacity of 5,000 liters; (ii) green waste processing equipment; and (iii) household septic tank replacement scheme for water-tight septage containers, through a community loan fund to be managed by the Ministry of Finance and Economic Development (MFED).The project, as designed, will also increase the capacity and reliability of existing water supply and sanitation on ten smaller, inhabited islands (motu) forming part of the Funafuti atoll chain. The major islets of Amatuku to the north and Papaelise and Funafala to the south of the main Fongafale Islet, will have their existing rainwater harvesting (RWH) systems (roofing, guttering, downpipes, and water storages upgraded).

Land Requirement

All project sites, except for one rural site north of the current urban area, will see construction of water supply and sanitation facilities occurring only on existing Government acquired and leased land for existing Government occupation and operations along Government leased roads (tar sealed). Details of the Government and Funafuti Kaupule lease payments for 2021/22 for all these Government areas are provided in this document.

There is no expected risk of landlessness, loss of home, and/or loss of major income source across all the project sites. No residential structure will be affected. The project will need the Government to acquire a land lease of approximately 3,900 m^2 from a currently unused rural land allotment located some 1.5 km north of the current Funafuti urban area. This site borders a relatively new Government lease, created in 2018, and just to the south, for the solid waste dumpsite operations.

Sub-projects Location	***Project Description***	***Land Requirements***	***No. of Affected Allotments***
1. Central Business District	Construction of a buried, piped water supply network with customer service connections.	None required for the installation of the piped water supply network will use existing road right-of-way (ROW) corridor and protect all	None (Government leased land – existing road lease)

Sub-projects Location	*Project Description*	*Land Requirements*	*No. of Affected Allotments*
		foreshore, as designed.	
	Construction of Two (2) water towers /elevated reservoirs	The two elevated reservoirs will also be built on existing government leased areas.	None (Government leased land)
2. North Lofeagai	Construction of septage drying beds (Stage 1 and Stage 2), wastewater treatment plant and ocean outfall and north/south access road.	A total land area of 3,190 m² for ten (10) registered allotments belonging to 5 APs required by the project for lease	Ten (10) registered allotment to be leased for Government. Development of the sanitation facility will ensure coastal vegetation is protected; accessway is given to public.
Total Required Land		**3,190 m²**	**5 APs (with 10 affected allotments)**

To reduce impacts to privately-owned lands, the sub-projects will utilize Government leased land by using road corridors, including the road easement, public parks, and lands adjacent to Government buildings for constructing the water supply piped network, elevated reservoirs, and other associated infrastructure. Road corridors will be utilized throughout the urban area of Funafuti. See attached letter of agreement from Funafuti Kaupule.

Affected Persons

Water supply. No APs will be impacted under the proposed construction of the main piped water supply network, pump station at PWD, 2 x 360m^3, two (2) elevated RC tanks and the RO desalination plant units, which will be in existing PWD buildings. This is not expected risk or impact to third parties to facilitate these connections.

Sanitation. There will be five (5) APs to be affected by the construction of septage drying beds that will require leasing a total area of 3,190 m^2 located in 10 allotted lands, packaged WWTP and the ocean outfall for primarily treated water.[1]

The Government has initiated the approach to secure the land through lease agreement with the individual landowners, like government approach in ongoing ADB financed projects in Tuvalu.

Key Stakeholders

There are three categories of stakeholders under this project: (i) Government, (ii) private sector including business owners and landowners and (iii) the public i.e., communities within the four (4) inhabited islands that comprise Funafuti atoll. The government stakeholders include: (i) Office of

[1] Please refer to attachment C– sanitation facility landowner approval and minutes of meeting 4 December 2023 for more information.

the Prime Minister (OPM) including Department of Lands and the Gender Affairs Department; (ii) Ministry of Finance and Economic Development; (iii) Ministry of Home Affairs, Climate Change, and Environment, including the Climate Change Department; (iv) Ministry of Public Works, Infrastructure Development, and Water (MPWIDW); and (v) Ministry of Health and Social Welfare.

Stakeholder Consultations

The Team consulted with the major stakeholders during site visits from 14 May to 22 June 2022 and 14 to 29 September 2022 and again 14 to 17 May 2023 in all sub-project communities. In total, at least 48 people were consulted during these consultations including 26 females (54%) during site visits and FWSSP awareness meetings.

Initial consultations in all subproject sites indicated a high level of support from the consulted communities including the affected church-run schools, business owners and the residential lot owners due to ongoing experiences with droughts and rising sea-levels causing groundwater level rise into household septic systems.

Also, the project team contacted and consulted the *Ulu fenua and the Matai* (the island chief and the clan leader respectively) of the native land located at North Lofeagai.

On 4 December 2023, consultations between the APs at the sanitation site, the Funafuti Native Land Committee, the Lands Department and PMU resulted in 5 out of 7 AP's agreeing to lease their land to the project. Subsequently, on 7 February 2024, the individual landowners signed a form which gives consent to the government to utilize their land for the FWSSP project. The lands department will draft up the land lease agreement between the government and these individual landowners. This agreement will ensure that the necessary land is secured for the implementation of sanitation facilities, providing improved access to proper sanitation for the population of Tuvalu. In addition, community education and awareness programs will be implemented to promote proper hygiene practices and the importance of maintaining clean water and sanitation facilities.

Grievance Redress Mechanism (GRM)

The GRM is a mechanism to receive and facilitate the resolution of stakeholder's concerns, complaints, and grievances about the Project, including concerns relating to environmental and social impacts and issues. The GRM allows stakeholders to comment on or express concern on matters relating to project implementation. It is intended to allow these various stakeholders to pass on important information to higher levels of project oversight and management in a neutral and, if necessary, anonymous way. A formal GRM will be implemented by the PMU and will be used for project-related grievances.

Below the grievance redress mechanism during the subprojects' construction outlines the procedures for how complainants will be able to file complaints and achieve resolution.

GRIEVANCE RESOLUTION PROCESS	
If an AP has any concern or grievance about the project, at any stage, they can submit a grievance to any level of their choosing. The recommended process is as follows:	
Stages in Response	**Required Activities**

Handling	
PMU - Grievance Focal Point (GFP) and Coordinator	Grievance Focal Point (PMU) verbally responds to questions and or complaints. If no response within one week or response is unsatisfactory, AP prepares a grievance in writing (utilize standard forms if available).
Contractor (Construction phase)	Receives grievance on site at the site office through its community liaison officer. Registers complaints (including verbal). Will provide feedback immediately, if possible, and report this immediately (within 24 hours) to PMU.
Project Implementation Assistance Consultant (PIAC)	This could be done after initial notification of grievance through the Grievance Focal Point and Coordinator (PMU), Contractor's site office, or through the PIAC (Resident Engineer/Project Coordinator).
PMU - Social Safeguards - Community Liaison Officer	Registers the written complaint and attempts to resolve it with the AP within one week. If a solution is not reached, the PMU refers it to the Ministry, MPWIDW
Ministry, MPWIDW (Secretary and department heads)	Ministry department heads and secretary, MPWIDW registers the complaint and works together with the PMU in the resolution provides a decision within one week. If the decision is still unacceptable to the AP, she/he may take it before the Land (or other relevant) Court, with all costs paid for by the project.
Land (or other) Court/Magistrates Court	The court hears the case and makes a final decision that is binding on all parties.

Environmental Baseline

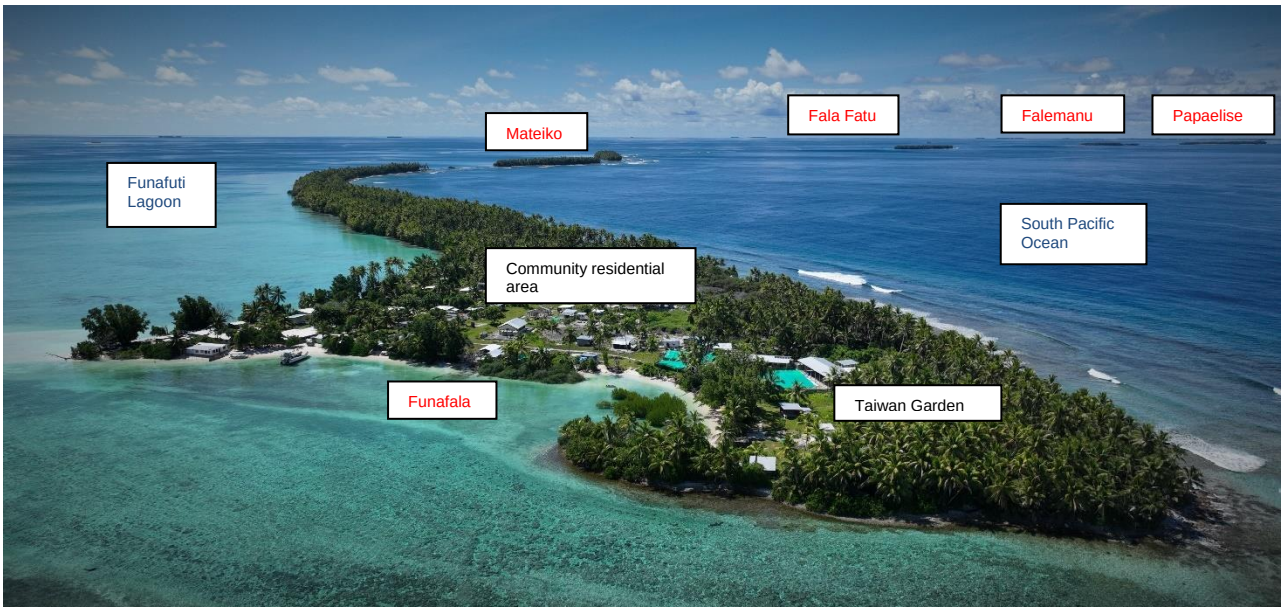
Funafuti's is an extremely low-lying coral atoll surface area of 275square kilometers. The land area of the 33 islets around the atoll of Funafuti totals of 2.4 square kilometers with an average height above mean sea level of 1.4m. It has a population of 6.340 people (2017 census) and it has more people than the rest of Tuvalu combine, with approximately 60% of the population. As such, Funafuti's terrestrial biodiversity and ecosystems are very limited and under significant pressure associated with high population density (resulting in habitat destruction/degradation, the spread of IAS and pollution of groundwater and lagoon water). With no freshwater wetlands, Funafuti's wetlands are dominated by brackish and shallow marine ecosystems, particularly inland ponds (Taisala) with mangroves and corals reefs in the lagoon and ocean. The marine environment comprises of generally several ecosystem types – oceanic, outer reef, lagoonal, back reef, lagoon floor, patch reefs, inland ponds and natural channels between the ocean and lagoon. The PRF Consultant in preparing the project feasibility study and concept proposal has ensued a good database of the stock photographs of the current urban area of Funafuti. The urban area in the central seven (7) villages is very heavily settled with the highest population

density figures in the Pacific region. See aerial photograph below showing roads, housing, and the international airstrip.

Figure 1: Aerial Photograph of the Funafuti Central Business District Showing the International Airport with Surrounding Residential, Government Buildings and Villages
(in Red Font)

Three (3) inhabited islets, Amatuku, Funafala and Papaelise are settled by indigenous Tuvalu residents. Assistance to increase the water harvesting and storage capacity in these islets will be conducted as part of this project by installing more water tanks and rehabilitation of water catchment on existing infrastructure. Maintenance works at these sites will have minimal impact to the existing environment and the Construction Environmental and Social Management Plan by the contractor will be developed prior to commencement of work which will address risks associated with the maintenance works required.

Figure 2: Settlement on Funafala Islet, Funafuti



For PRF Phase 2, the detailed engineering phase, the PRF Consultants will further survey and map a main water supply pipeline route onto photomaps of the existing streets. This will provide details for the future civil works contractors to place water supply infrastructure components within the road easements and minimize the interaction of this new buried infrastructure with existing underground power cables and telecommunications cables as well as avoid intruding privately own land.

A service agreement will be developed by the Government of Tuvalu and be made between the landlord and individual households to be connected to the water supply system. The service agreement will outline the responsibilities of both the service provider and the households, including payment terms, maintenance of the water infrastructure, and water conservation measures to ensure sustainable water use.

Land plots in Funafuti are owned by family groups, called the Aliki, and they will play a key role in the implementation of the water service agreement to connect houses which are further away from the pipe network. These agreements will help ensure that the water supply system in Tuvalu is effectively managed and maintained, and that the households have access to clean and reliable water.

As per procedure, PWD will first inspect and approve connections from the road easement to the households located within the community interior. Similar approach has been used already for Telecom and Electricity connections. If in case the households are occupied by tenants, the tenants will request the landlords to install the connection to the network. The landlords will consult PWD and sign the service agreement, and PWD will proceed with first inspecting the site before approving it. The tenants will be responsible for payment of the water usage to the PWD.These water supply network photomaps will also provide an excellent environmental baseline for existing important vegetation and the minimal surface water resources following rain events. Photomaps will be produced for all gazette Funafuti roads, as main water supply pipes shall be installed in each of these roads over the life of the project.

The household, commercial or institutional water service connections, connecting the main water pipe metered connection and the building/household will be constructed under a Customer Service Agreement between the PWD and the individual households, whereby that house owner/occupier/customer provides the land access for the service connection and the project provides the materials and labor for the connection.

Whilst the sanitation sub-component's proposed infrastructure (septage drying beds, packaged wastewater treatment plant and an ocean outfall diffuser) will be constructed in a more fragile and vulnerable environment, the impacts and risks will be integrated into the design and mitigation measures will be implemented. The current disposal site for raw septage can be seen in the figures below.

Figure 4: PWD/WSD septage pump out truck discharging its load of raw septage

Figure 3: Existing Raw Septage Discharge Point in Shallow Pits at North Lofeaigi

The site proposed for the new sanitation facility includes ten (10) septage drying beds, one package sewage treatment plant and a sea outfall. An access road will also be developed adjacent to the facility to allow for movements of locals to the recreational sites and residence at the northern end of the islet. It will be critical in the design of these facilities in PRF Phase 2, that the fragile foreshore vegetation located on the lagoon side and the ocean side of this site will be retained.[2]

A rapid marine baseline assessment of the reef ecosystem and reef slope along the outfall site as well as baseline water quality assessment at the site will be undertaken once the location is finalized during phase 2 as shown in the map below. A marine expert will be hired to undertake this survey.

[2] Please refer to appendix E for concept designs of the sanitation facility

Figure 5: Map Showing the Proposed Location of the Primary Sewage Treatment Plant

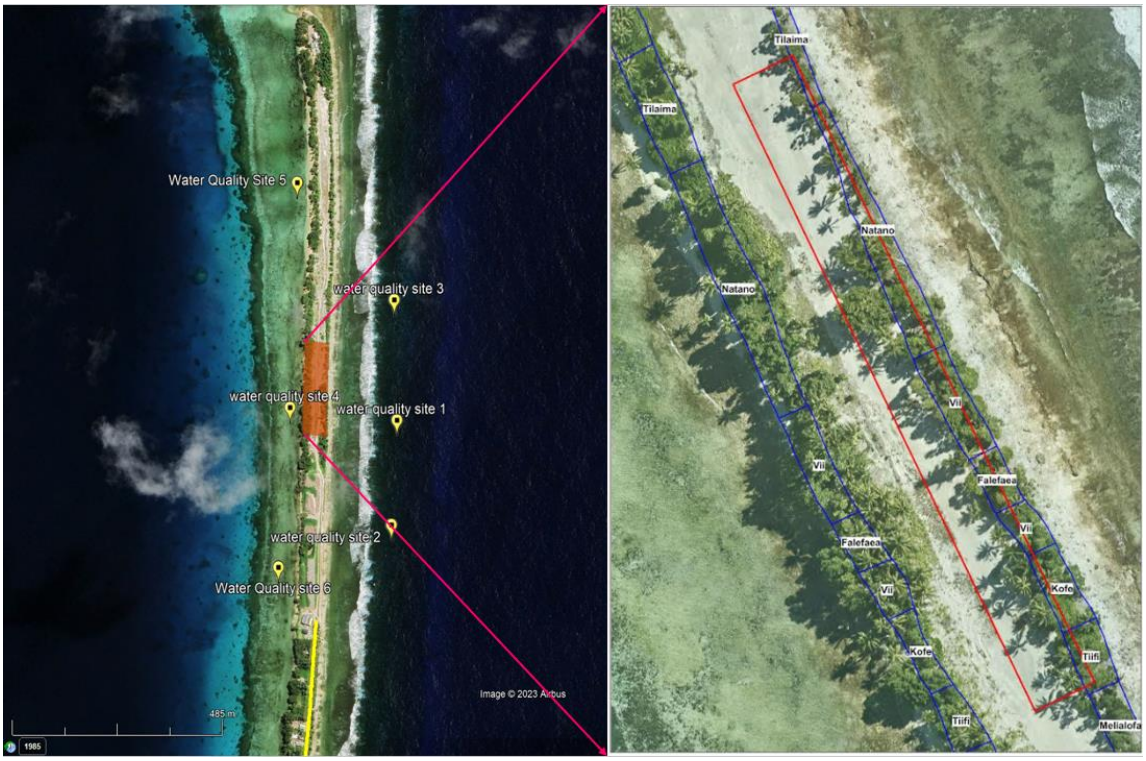


Figure 6: Proposed Area for Primary Sewage Treatment Plant, Just Next to the Current Solid Waste Disposal Site, Northern Tip Of Lofeagai, Funafuti

It will also be an objective for the detailed engineering team to ensure that the infrastructure is, wherever possible, built around existing coastal vegetation and that these be incorporated into the infrastructure/landscaping to be undertaken at the site. The site will be fenced off and provisions for road access for locals and residents who reside further north will be provided.

Monitoring and Reporting

Upon finalization of the FWSSP IEE and approval of the GoT's Environmental Impact Assessment, the successful civil works contractor(s) will be required to prepare and submit a construction Environmental and Social Management Plan(s) (CESMP) together with a mandatory Traffic Management Plan(s) (TMP), Waste Management Plan (WMP) and Health and Safety Plan (HSP) and submit these to the PMU and the Department of Environment for approval.

Relevant information related to workplace health and safety requirements, public safety, and compliance with the EMPs and TMPs will be reported in the contractor's progress reports and reported by PMU/PIAC in semi-annual safeguards reports to ADB and GoT.

The primary objective of monitoring is to identify as early as possible the activities achieved and the cause(s) of constraints so that the arrangements in the IEE/CESMP implementation can be adjusted. The early identification of the causes of delay will enable the PMU (with support from the PMU consultants), to prepare the mitigating measures during project implementation.

All development and implementation tasks will be monitored internally monthly, and progress reported to the government and ADB on a semi-annual basis as well as the quarterly. Monitoring will be carried out by the PMU Safeguards Unit, with the assistance of the social safeguard specialist(s), Funafuti Kaupule, Contractor or PIAC. All data collected will be disaggregated by gender. These will be collected and will be reported monthly to the PMU to assess the CESMP implementation progress and adjust the work plan if necessary. These reports will be consolidated in the supervision reports for ADB and submitted semi-annually.

The proposed location for the infrastructure will be designed during PPP2 and constructed by the Contractor. The Design Engineer has undertaken preliminary designs to set the general spatial requirements of the elevated reservoirs, sanitation facility including outfall and the installation of the piped water network along the road easement. The Design Engineer is required to ensure that the infrastructure will have the following features:

- Construction of two new elevated reservoirs are within 25x25m area per elevated reservoir and install fencing around the perimeter for safety.
- Installation of piped water network within the footprint of the existing road easement
- Construction of sanitation facilities within the allocated land plot whilst retaining existing coastal vegetation.
- Provide access way to public around/through the sanitation facility.
- Construct the outfall at the ocean side.
- Develop and implement the Traffic Management Plan to ensure minimal disturbance to public road users during construction.
- All civil works design by the Engineer/Contractor shall be for a design life of 40 years.

The final design for the elevated reservoir has not yet been finalised, however, it will likely consist of a form of concrete piled foundation.

The overall objective of this report is to provide an Initial Environmental Examination report for the climate resilient infrastructure solutions which encompass items described above and includes all ancillary infrastructure for works. As part of that process, this IEE has undertaken screening of the project as it is known and scoping of the potential impacts, it provides a description of the baseline conditions, it details the predicted qualitative and quantitative impacts from the project activities and provides safeguards management and monitoring plans to avoid, mitigate or remedy.

The key impacts identified in this report are as follows:

1. **Elevated Reservoirs**

- Protection of foreshore.
- The influx of overseas workers to the island.
- Location of workers camp.
- Protection of the beach berm and vegetation line.
- Source of aggregates and construction material
- Potential introduction of invasive alien species during construction
- Storage of aggregates and construction materials
- Noise and dust pollution
- Workers and community health and safety
- Waste Management during construction.

2. **Sanitation Facility**

- Protection of the foreshore.
- Solid waste management.
- Water quality in the nearshore environment.
- Wastewater management.
- Workers and community health and safety
- Accessway to public
-

3. **Installation of Piped Network**

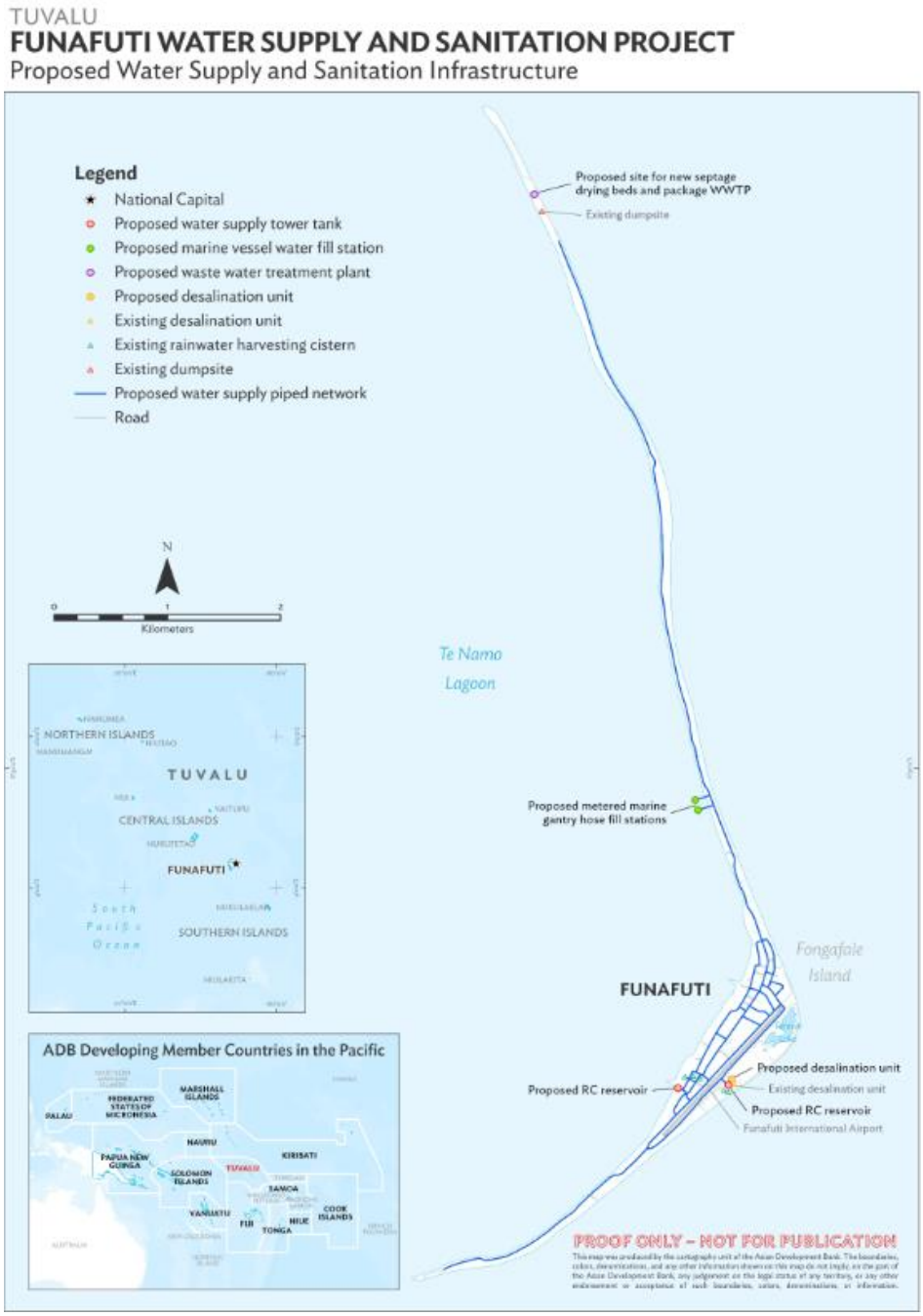
- Traffic management during construction
- Confining works within road lease area
- The influx of overseas workers to the island.
- Location of workers camp.
- Source of aggregates and construction material
- Potential introduction of invasive alien species during construction
- Storage of aggregates and construction materials
- Noise and dust pollution
- Workers and community health and safety
- Waste Management during construction.

4. Desalination Facility

- Brine water will be pumped out to the ocean (concentrated salt water). Currently being practiced by PWD. Use the same outlet that PWD is currently using.

The contractors CESMP, Grievance Redress Mechanism and a Stakeholder Engagement Plan are designed to address these issues during the implementation of construction works through associated management plans outlined in the CESMP.[3]

Figure 7: Map Showing the Extent of the Proposed Water Supply Piped Network In Fongafale, Funafuti



[3] Please note that some of these impacts will also be monitored and managed during operation period. Refer to section F of the document – Environment Management Plan.

I. INTRODUCTION

A. Background

1. The Government of Tuvalu (GoT) has requested Asian Development Bank (ADB) assistance to support the water and sanitation sector in Funafuti. Given the importance and magnitude of the proposed water and sanitation project, a project readiness financing (PRF) project is required to ensure high-level readiness of the ensuing projects, and timely and cost-effective achievement of project outcomes.

2. **Inadequate water and sanitation services:** Funafuti faces many urban challenges seen in other cities, particularly inadequate water supply and sanitation services, and an increasingly high rate of communicable diseases. The groundwater is unsuitable for drinking because of saltwater intrusion and anthropogenic contamination. Rainwater harvesting is the primary source of drinking water all over the country. Despite high average annual rainfall (3,483 millimeters), Funafuti frequently experiences short dry periods. Dry periods longer than 10 days typically result in water shortages, which require desalinated water to be delivered via trucks to household and community tanks.[4] The desalination plant, with a capacity of 100 cubic meters per day, is operated by the Government through the Public Works Department (PWD), a division of the Ministry of Public Works, Infrastructure Development, and Water (MPWIDW). The desalination plant's capacity cannot meet demand during severe droughts and the existing water storage capacity in Funafuti limits resilience to prolonged drought.

3. Most households rely on on-site sanitation facilities as Funafuti has no centralized sewer system. About 86% of households have flush toilets with septic tanks, 7% have pour- flush pit latrines, and 3% have composting toilets.[5] However, most septic tanks are poorly constructed, with no desludging, and are breached during flood events.[6] Open defecation occurs in Funafuti as some households have limited or no sanitation facilities.

4. A recent sanitation review concluded that most people in Funafuti are aware of issues relating to sanitation, hygiene, water management, and water resource degradation and depletion.[7] Despite the residents' desire to tackle these issues and disseminate knowledge on good hygiene practices, hygiene behaviors in Funafuti are negatively influenced by the lack of water and sanitation facilities. A 2015 Yale University report concluded that decreased water availability in the 2011 drought and poor hygiene behaviors resulted in a large outbreak of diarrhea, particularly among infants.[8] The report concluded that further interventions are required to mitigate the health impacts of droughts. Improved programs are required to promote sustained hygiene awareness and behavior and safety of drinking water.

5. Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on peoples health. Basic and safely managed sanitation services can reduce diarrheal disease, and can significantly lessen the adverse health impacts of other disorders responsible for death and disease among millions of children. Diarrhea

[4] The Public Works Department (PWD) delivers desalinated water to community tanks for free for collection by residents as well as households on order. Households are charged A$27 per 500 gallons ($8.16 per cubic meter) for delivery

[5] Government of Tuvalu. 2012. Population and Housing Census. Funafuti.

[6] The PWD charges A$60 to empty household septic tanks. The septic trucks typically discharge untreated sewage directly offshore at the north end of Fongafale islet.

[7] J. Dennis. 2019. Sanitation Review: Funafuti, Tuvalu. Unpublished

[8] J. Emont. 2015. Drought As A Climatic Driver Of An Outbreak Of Diarrhoea In Tuvalu, South Pacific. New Haven

and worm infections weaken children and make them more susceptible to malnutrition and opportunistic infections like pneumonia, measles, and malaria. The combined effects of inadequate sanitation, unsafe water supply and poor personal hygiene are responsible for many of childhood deaths. Every year, the failure to tackle these deficits results in severe welfare losses - wasted time, reduced productivity, ill health, impaired learning, environmental degradation, and lost opportunities.

6. The Funafuti urban area currently does not have a public, piped water supply system providing water through a metered connection and plumbed to the household/building. Supporting Tuvalu's efforts to improve its water supply system and sanitation will contribute to a healthier and more productive population and assist in the achievement of the United Nations 2015 Millennium Development Goals (SDG 6) of universal access to water and sanitation. Ensuring that all Funafuti households have reliable, access to a basic, piped, water supply, and preferably intermediate access or higher, is a priority. The water and sanitation sector in Tuvalu is almost publicly funded and there is a strong rationale for public sector financing in Tuvalu.

7. **Governance:** Multiple organizational changes subsequent to the 2013 National Water and Sanitation Policy have left gaps in accountability and inter-agency coordination. The government is exploring various institutional arrangements to support sustainability in the sector.

8. The PRF will support the government in preparing engineering designs, surveys, and other start-up activities (preparation and implementation of due diligence and procurement support) for the proposed Funafuti Water Supply and Sanitation Project (FWSSP). Together with the improvement of project implementation capacity of the executing and implementing agencies, the PRF will support the government in analyzing, assessing, and potentially designing a new institutional framework to create an enabling environment for the ensuing project.

9. The PRF will streamline the initial investment project contract awards and expedite initial disbursements for the project. The PRF will finance investments to (i) create an enabling environment for the ensuing investment project (output 1) and (ii) identify project investments and complete detailed engineering design (output 2). The PRF will finance consulting firms, a non-government organization (NGO), and individual consultants.

10. The GoT, MFED, and the Water and Sanitation Department (WSD) of the MPWIDW gratefully acknowledge the funding by the ADB through project readiness financing (PRF) for the preparation and design of the FWSSP. The GoT and the WSD also acknowledge the input of EGIS MARITIME France and SCOPE Engineering Fiji in the preparation and design of this project.

11. FWSSP is designed to provide outcomes through the following components:

Component 1: Public piped water supply service constructed in Funafuti.
Component 2: Public and environmental health enhanced through improved sanitation services.
Component 4: WSD delivery of urban utility services strengthened.

12. This report is deliverable 8.2 of the FWSSP Project Preparation Phase 1 (PPP 1) study. This output is required to include the following[9]:

[9] Extract from Project's Terms of Reference (TOR)

13. **Deliverable 8: Investment Project Due Diligence:** Undertake the following tasks in consultation with key stakeholders and with guidance of the PMU.

B. Environmental Assessment

a) Assess the project's environmental impact in accordance with ADB's Safeguard Policy Statement (SPS) 2009, including environmental health and safety guidelines, and the environmental laws, regulations, and policies of Tuvalu. The assessment process will include: (i) fieldwork, consultations, surveys, and where required quantitative sampling of areas affected by the proposed investments, to provide sufficient data for the description of the existing environment (baseline conditions). The baseline will also include; (i) based on information gathered for the poverty and social assessment present socio-cultural and economic characteristics, including identification of possible physical and cultural resources; (ii) in coordination with the social and gender specialists, undertake consultations with affected people, beneficiaries and stakeholders in the project area to explore their perceptions, suggestions, and acceptance of the project, and the preparation of a record of the public consultations; (iii) linked with the resettlement plans, and based on processes being implemented in other projects in Tuvalu, identify and establish a grievance redress mechanism; and (iv) identify the potential impacts on physical, biological and socio-economic environment during pre-construction, construction and operation of the investments. Baseline data should be up to date and quantified, consultation is to be meaningful, and impact assessment must be quantified.
b) Assess the institutional capacity of: (a) PMU to monitor implementation of the EMP, and (b) Tuvalu Department of Environment and other concerned agencies in clearing and monitoring environmental assessments and issuing development consents, licenses and/or permits, and monitoring compliance.
c) Prepare the project initial environmental examination (IEE) and initial environmental examinations (IEE) for the core subprojects, including environmental management plan appropriate for each investment. The IEE will be prepared in accordance with SPS and follow the format as set out in Annex 1 to Appendix 4. The IEEs will be prepared in accordance with SPS and follow the format as set out in Appendix 1 paragraph 9. Assess potential impacts of climate change on the project and recommend adaptation measures for resilience to climate change or variability in project design. The IEE also include a section presenting the findings of the environmental institutional capacity assessment and with recommendations to build capacity.

Deliverables:
8.2 Draft initial environmental examinations (IEE)
8.4 Final initial environmental examinations (IEE)

14. The project consultant has carried out feasibility studies on the potential water supply and sanitation subprojects on the main island (Fongafale Island) of Funafuti Atoll and the other three inhabited islands of the atoll group, Amatuku Island to the north and Papaelise and Funafala Islands to the south.

15. This IEE assesses environmental impacts of the proposed infrastructure subprojects and assesses potential social, poverty, and gender impacts for project stakeholders. The consultant

has visited Tuvalu on three occasions (both with other members of the PRF studies team) to gather information and meet with stakeholders as part of the feasibility study, as follows:

(i) The first Tuvalu assignment visit in April/May/June 2022 included four days in Funafuti working with the PMU, the *Ulu fenua* of Funafuti, and the Funafuti Land Council (Funafuti Kaupule and community) for site visits to two (2) sites (Lofeagai north) that will be acquired, discussions of the land area requirements and FWSSP proposal presentations. It also included meetings with Lands Department officials to source updated Government lease maps and documents including currency of lease payments for all of the Government operation lands upon which the project proposed that water and sanitation infrastructure be constructed (i.e., PWD HQ area; QE II Park and all road easements in the Funafuti urban area;

(ii) The second Tuvalu assignment visit in August/September 2022 included five days in Funafuti working with the PMU, the *Ulu fenua* of Funafuti, and the Funafuti Land Council for investigation of progress on resolution of government land lease issues, assessment of potential alternate sites, if required, updated FWSSP proposal presentations, and discussions of the proposed GRM for land acquisitions under the FWSSP. Also included was travel by boat to the other Funafuti Atoll islands with short stops on Amatuku Islet, Papaelise Islet, and Funafala Islet, respectively, to inspect FWSSP proposals to provide additional water storage tanks to all households on these islets.

(iii) The third Tuvalu assignment visit in May 2023 included ten days in Funafuti working with the PMU, the *Ulu fenua* of Funafuti, the Funafuti Land Council, the Funafuti Kaupule and the Department of Lands and survey for investigation of progress on resolution of government land lease issues. FWSSP concept proposal presentations were again made to the Funafuti Kaupule and the Government Advisory Committee (GAC), together with further discussions of the proposed work sites being confined to the Government Road easements and the GRM for land acquisitions under the FWSSP.

16. This IEE is a compilation of due diligence findings and has been updated following the September 2023 visit including meetings with affected landowners and the Kaupule in December 2023.

C. Water Supply and Sanitation Policy

17. The *Fakanofonofoga Mo Vai Mote Tumaa* (Tuvalu Sustainable and Integrated Water and Sanitation Policy – 2012-2021, hereinafter referred to as the WSP) was developed with a set of guiding principles, consistent with those of the Tuvalu Constitution, *Te Kakeega* III, NAPA, *Te Kaniva*, and other national frameworks. Importantly, the WSP, owned by the people of Tuvalu, adopts the following guiding principles, which will be used to guide the water supply and sanitation service level planning for Funafuti.

I. **Access to safe drinking water and sanitation is a fundamental human right.** Access to facilities should not be confined to certain sectors of the community, and the WSP aims to ensure that the daily needs of all Tuvaluans, including the most vulnerable, are met;

II. **Water is everyone's business.** All Tuvaluans have a role in the management of water and sanitation. The effective implementation of the WSP will depend on the success of integration, coordination and collaboration between responsible ministries, departments, Kaupule, NGOs, the private sector, civil society organizations (CSOs),

and international partners. The WSP encourages the effective participation of community stakeholders in planning, setting of rules and standards, implementation, monitoring, and evaluation. The WSP also recognises that women have a key role in the management of water;

III. **Water and sanitation services in Tuvalu should, over the longer term, operate on a sustainable basis.** The WSP acknowledges the importance of ongoing partner support to help address some of Tuvalu's more serious water and sanitation challenges, but also recognises that, over time, a more sustainable footing is needed for our water and sanitation services;

IV. **Managing risk is more effective than responding to consequences.** The WSP recognises that managing the water-related impacts of climate variability and climate change requires a risk-based approach, and adaptation to these impacts requires integration of effective risk reduction strategies across all sectors; and

V. **Effective water management is an important national response to the impacts of climate change.** The WSP recognises that there is an urgent need to improve our capacity to deal with today's serious water challenges, in order to improve our ability to adapt to the challenges cause by climate variability and climate change.

18. A key performance indicator in the *Te Kakeega* III, Tuvalu's National Strategy for Sustainable Development 2016-2020 (TKIII) relates to the development of sufficient water storage on all islands for a drought of up to six months. An additional indicator is that which relates to the reduction in the number of buildings that lack efficient guttering and water tanks.

D. Water Supply

19. The Funafuti urban area currently does not have a public, piped water supply system providing water through a metered connection and plumbed to the household/building.

20. Ensuring that all Funafuti households have reliable, access to a basic, piped, water supply, and preferably intermediate access or higher, is a priority. Ensuring that everyone has at least an intermediate level of access is consistent with meeting SDG Target 6.1.1.

21. In the light of these principles, it is important that Tuvalu sets high yet achievable water supply service goals for the national capital Funafuti. With donor partner assistance, Tuvalu will seek to realize:

- Short-term: Establishing a sustainable, basic level water supply service (around 20 litres/person/day) in Funafuti by 2030
- Medium-term: Maintaining a sustainable, basic level water supply service (around 20 litres/person/day) in Funafuti through to 2040; and
- Long-term: Building to Intermediate level water supply services (around 50 litres/person/day) in Funafuti by 2050.

22. The project proposed addresses the water supply sub-project required to deliver the medium term 2040 objective described above and where, be constructed with a core piped network system that has the capacity to meet 2050 objectives.

E. Sanitation

23. Current sanitation service levels in Funafuti are considered to be basic, improved with some villages/household clusters considered to be limited, improved. In extended dry spell/drought situations (low rainfall for 25 to 30 days or more) the scarcity of water forces sanitation service levels to drop to unimproved for a significant number of households. In these situations, there can often be a return to open defecation practices using the lagoon.

24. In the short-term, ensure that every household could sustain a continual, basic, improved sanitation service level, Funafuti would be considered to be meeting SDG Target 6.2.1 for improved sanitation - “Sanitation for All”.

25. With the assistance of their donor partners, Tuvalu will seek to realize:

- Short-term: Sanitation service is raised to the safely managed, improved classification with investments for septage transport, off-site treatment and safe disposal, commencing programme for replacement of property on-site treatment and disposal systems (OSTDS) (septic tanks) with secure, septage containment tanks by 2030;
- Medium term: Sanitation service maintains and strengthens the safely managed, improved classification with investments for further off-site treatment facilities, continuing the programme for replacement of property on-site treatment and disposal systems (OSTDS) (septic tanks) with secure, septage containment tanks, and transport infrastructure by 2040; and
- Long-Term: sustainable safely managed, secure, improved sanitation service levels (the basic classification is raised to a safely managed classification for all of the Funafuti population) by 2050.

26. The project proposed addresses the sanitation sub-project required to deliver the short-term 2030 objective described above, whilst having a flexible design approach allowing for expansion of these facilities to meet the further 2040 and 2050 demands.

F. Disaster Resilience

27. Key climate change impacts and consequences that Funafuti authorities and residents need to urgently adapt, reduce the risks, and strengthen disaster resilience, include the following:

- Sea level rise
- Intensity and frequency of tropical cyclone
- Storm surges
- Coastal erosion and loss of land
- Saltwater intrusion into water resources, soil, and cultivation areas
- Drought resilience
- Increasing temperature (heat stress)
- Coral bleaching
- Biodiversity loss

28. Climate vulnerability risk assessment for the project shows that both sub-projects will be mainly vulnerable to increased exposure of coastal areas to erosion and overtopping of hard erosion protection infrastructure, particularly along the foreshore on the lagoon side of Fongafale Islet.

29. Major adaptation options relate to the protection of water storage and supply infrastructure from coastal erosion. Where infrastructure is required in areas near the coast, localized protection may be required and a strategy for its continued monitoring and maintenance will need to be provided.

30. Mitigation considerations include carefully analyzing proposed technologies and installations to identify energy efficient options with a view to limiting capital and operating and maintenance (O&M) costs. And while the new water sources for the piped system are expected to be mainly from RO desalination plants, these plants have made huge advances in energy efficiency over recent years, but the use of PV power, where possible, will be examined to contribute to Tuvalu's CO_2 mitigation targets, and improve resilience by reducing reliance on imported fossil fuels.

31. In collaboration with the Climate Change Department (CCD), WSD, and Department of Environment (DoE), relevant NGOs and CSOs together with Funafuti residents further develop and implement a community-based disaster risk management program (CBDRM), which will raise awareness while educating in risk mitigation, climate change adaptation, drought preparedness and response, as well as on the relevance of properly maintaining on-site septic systems in the face of rising sea and groundwater levels.

32. Coastline protection measures will be also built or enhanced using different hard and soft engineering and bioengineering techniques[10] to control the coastline erosion and reduce the impact of flood surges and tsunamis Funafuti. This output will complement the current Tuvalu Coastal Adaptation Project which focuses on reclamation works within the lagoon in Fongafale ensuring coordination and complementarity among the activities of both projects and avoiding overlapping.

33. This subproject will seek to incorporate into the CBDRM, effective health and hygiene education principles that seek to promote community awareness and actions that minimize public health risks usually associated with natural disasters such as tropical cyclones, storm surge, king tides, tsunamis, and climate change impacts of rising sea level, rising temperatures, abnormally heavy rainstorms and prolonged dry periods or droughts.

G. Urban Services Delivery

34. Notwithstanding the considerable progress that WSD has made over the recent years, capacity within the organisation is still limited. There is a need to enhance management capacity and to develop technical planning to be able to manage the proposed investment projects, procurement, contracts, and operations. Capacity is needed to develop and implement the asset management system, set up and manage GIS, planning for and management of projects such as proposed in this document.

35. The majority of this technical support will be directed towards assisting PMU and PWD/WSD with the management of procurement, civil works contracting, commissioning and take-over, and the ongoing O&M of the works as they are progressively implemented and then handed over.

[10] Such as rock gabion construction and coastal vegetation rehabilitation.

36. In the financial and human resources management areas there is a need for increasing management and planning capacity to:

- plan and manage accounting, tariff and charges setting, billing and metering programs;
- ensure legislative and regulatory water supply and sanitation service performance indicators are met; and
- improve human resources planning and recruitment and/or sharing of new key, professional and technical staff.

37. A high percentage of WSD staff only has secondary school level education and WSD is facing difficulties in finding suitable new staff, especially in the technical fields related to water supply and sanitation services planning, design, construction, and O&M. Training to be provided through FWSSP is needed on issues such as:

- Project management/contract management;
- Technical planning;
- Water resources management and water supply design;
- Asset management;
- O&M of pumping units and pump monitoring systems; and
- Water quality monitoring and testing.

38. It is probable that there could be considerable benefit in the project assisting the PWD/WSD to seek further regional assistance from the Pacific Water and Waste Association (PWWA) based in Apia, Samoa. This association has in the past years with ADB support implemented several “authority twinning” arrangements between small Pacific authorities and New Zealand or Australian rural city/town authorities/corporation for two-to-three-year period. These arrangements are set-up with a number of objectives e.g., create or improve asset management (planning and budgeting); leak detection (non-revenue water) reduction; water meter servicing; pumping machinery O&M.

39. These arrangements see staff from both agencies spending, sometimes considerable time, on secondments or technical visits for up to 2 or 3 months for training and mentoring in each other’s agencies. This could be vital for a small agency like PWD/WSD for FWSSP.

H. Summary of proposed Funafuti Investment

FIGURE 8: MAP OF FUNAFUTI ATOLL, TUVALU

40. Funafuti atoll consists of 29 islets, see figure 1-1, of which 4 islets are inhabited.

41. The populations for each inhabited island in Funafuti atoll group, as available from the the 2020 COVID 19 household survey, are as follows: (i) Amatuku – population 61; households 10; (ii) Fongafale – population 5,801; households 943; (iii) Papaelise – population 27; households 4; and (iv) Funafala – population 53; households 9.

42. The central area of Fongafale Islet, Funafuti Atoll, contains the urban center of Tuvalu including the Government Office Building, the airstrip and passenger terminal, the new Queen Elizabeth II (QEII) Park and Convention Centre, and most other major government buildings, see Figure 2.

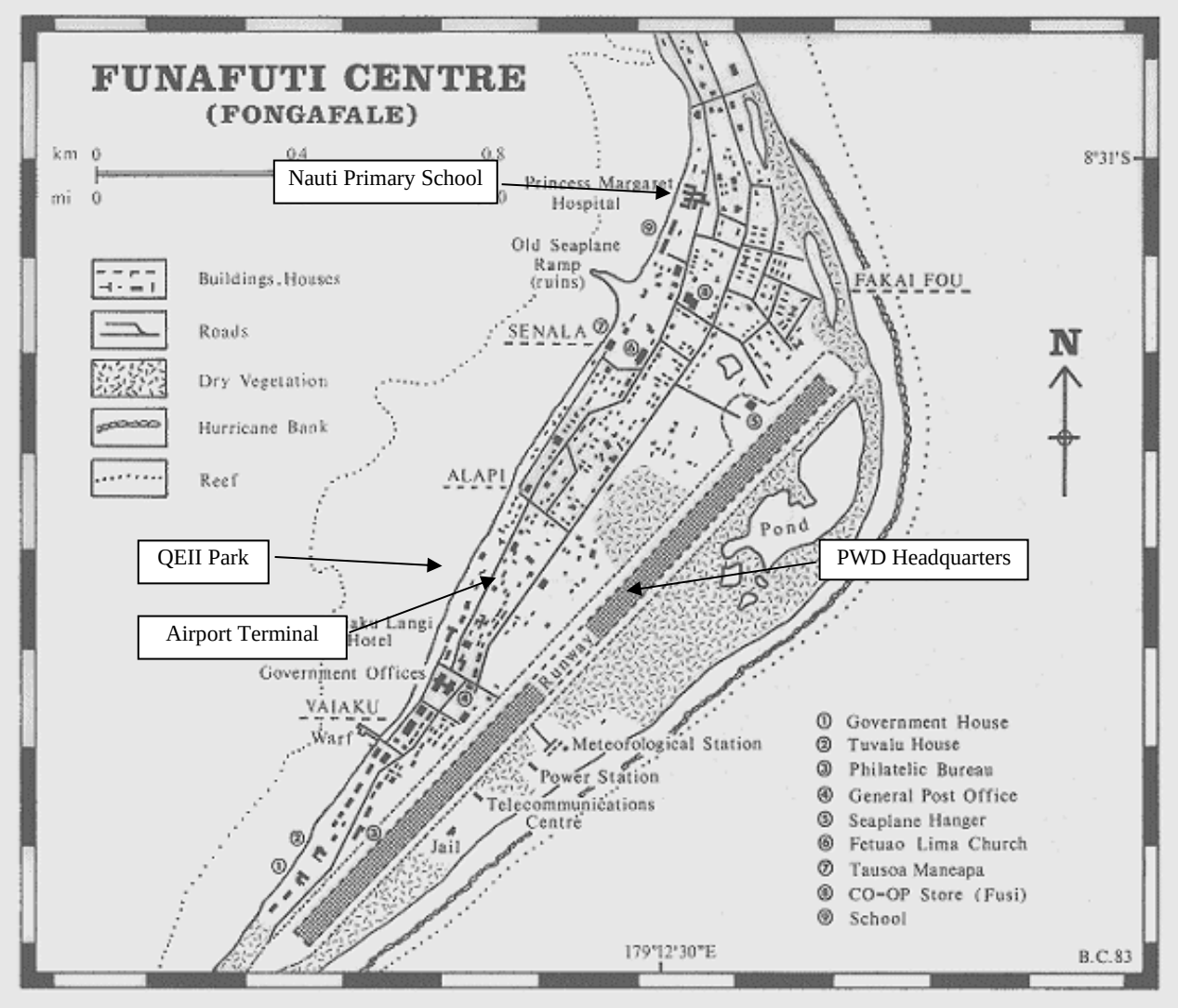
43. The large proportion of the population of Funafuti atoll live on the main island of Fongafale. Here the population is divided into seven village groups, named from north to south, - Lofeagai, Teone, Fakaifou, Senala, Alapi, Vaiaku and Tekavatoetoe. All villages are under the Funafuti Kaupule (local government).

44. The Funafuti urban area currently does not have a public, piped water supply system providing water through a metered connection and plumbed to the household/building. Ensuring that all Funafuti households have a future, reliable, access to a basic, piped, water supply, and preferably intermediate access or higher, is a priority for improved public health, hygiene, and economic advancement. Ensuring that everyone has at least an intermediate level of access is consistent with meeting SDG Target 6.1.1.

45. The Funafuti water supply subproject includes construction of a new water supply, piped distribution network and elevated storage reservoirs. Land requirements are thus limited to Government properties, reserves, and easement themselves, which are already subject to Government current, operational leases.

46. For the water supply services subproject, no resettlement of any kind (voluntary or involuntary) will be required. Ownership of the foreshore and seabed vests in the Crown subject to any public rites of passage, navigation, and fishing and to any private rights that may exist in or over the foreshore and seabed. The sanitation subproject includes construction of a new septage handling and treatment facility to be constructed to the north of the existing controlled solid waste dumpsite located at North Lofeagai. Land requirements are limited to this site only, which is currently under the control of the *Ulu fenua* (Clan Chief) of Funafuti. The *Ulu fenua* and the Funafuti Land Council are supportive of this development and the process to lease the land has been initiated with close coordination with the Department of Lands.

Figure 9: Funafuti Central Urban Area Map



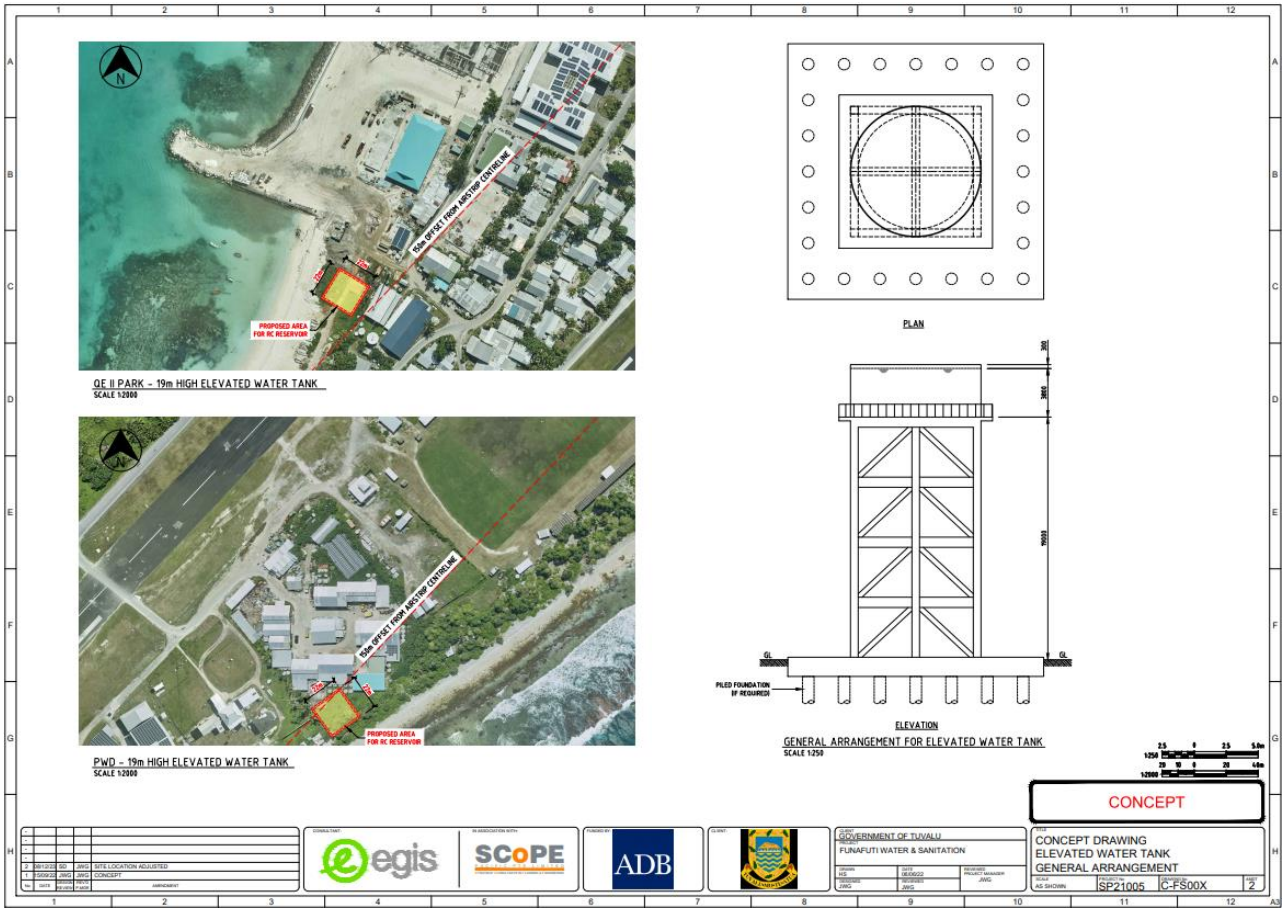
47. All civil works for water supply and sanitation infrastructure for FWSSP will require building permits for the works, which will be designed following the draft National Building Code of Tuvalu (2021). For water supply and sanitation components, recognised international standards for pipes, valves, fittings, pumps and their ancillary equipment and drainage and plumbing services, will be used.

48. The application, approval, and issue of building permits is administered by the PWD of the MPWIELMD. This development consent process involves a number of other Government institutions, which must also provide their approval to PWD stating that the development proposed meets their requirements. This will include discussions with PWD during the design phase and submission of construction permit approvals to the Funafuti Kaupule and the Department of Environment.

I. Component 1 - Public piped water supply service

49. For the water supply services subproject, parts of two existing leases of Crown land for the existing PWD headquarters and Queen Elizabeth II Park will be used as sites for the construction of reinforced concrete (RC), elevated, roofed water storage reservoirs. These roofed reservoirs will also be fitted with an RWH system.

Figure 10: Concept Design of Elevated Reservoirs



50. The reservoirs will be supplied with water from the following sources, see

Table 0-1.

Table 0-1: Water Sources Proposed For Funafuti Water Supply System

No.	Site Name/Location	Reservoir Capacity	
		Imp. gallons	M^3
	RO Seawater Desalination Unit		
A	PWD Desalination Unit – No.1 – 180 m^3/day	Existing	
B	PWD Desalination Unit – No.2 – 200 m^3/day	Future - 2025	
	Existing RWH Cisterns/Reservoirs		
2	**Marine [A], Teone**	**120,800**	**549.64**
5	**Government Main Office, Vaiaku**	**361,486**	**1,644.76**
6	**Terminal, Vaiaku**	**240,500**	**1,094.27**
7	**Tulakiiga, Vaiaku**	**250,750**	**1,140.91**
9	**PWD 1, Vaiaku**	**350,000**	**1,592.10**
10	**PWD 2, Vaiaku**		
	Totals	**1,883,165**	**8,567.97**

Note: A Marine Port reservoir will be linked only to marine bulk water filling station.

51. Connections to existing RWH cisterns will be fitting with meters for recording purposes.

52. For the water supply services subproject, the piped water supply system to the elevated reservoirs and the gravity fed, water supply piped distribution network will be constructed within the streets/roads of Funafuti. These construction/installation sites will spread across 407 existing plots which have been partially leased by the government for the existing street/road system, see Figure 11 and is projected to meet demands till 2050.

Figure 11: Proposed Water Supply Service Pipework To Elevated Reservoirs (To 2040)

53. A piped network distributing the water supply from these elevated reservoirs will then be laid in each gazetted street/road of the Funafuti urban area. The necessary fittings and valves required to ensure that the network is an operating system will also be installed. Valves controlling zones of the network will be provided in underground valve chambers with metal lids for security. These will allow water to be shut-off to a particular zone or redirected to other zones depending upon the O&M needs from time to time.

54. A service connection (stop valve, water meter and non-return valve) will be provided to each Government office/building, commercial business, institution (churches, foreign delegations) and households completing an application for service and service agreement with PWD/WSD.

55. To deliver the project as proposed, the landowners are not required to amend the existing agreements with the Government. The existing lease agreements are thus considered to be voluntary negotiated settlements with appropriate annual payments. Annual lease payments are up to date for all the Fongafale Island lease properties. Copies of the latest payment schedules (September 2021/2022) are provided in Attachment B.

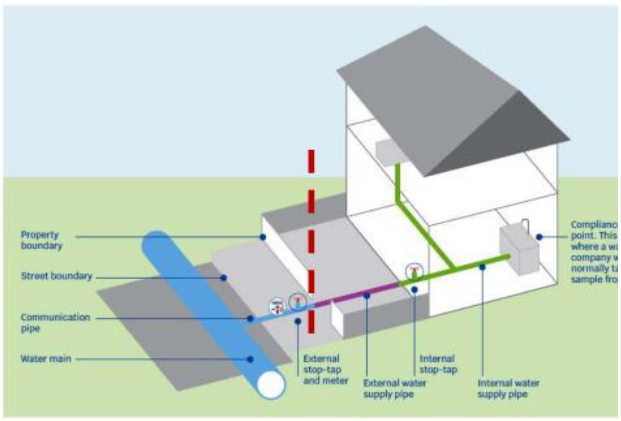
56. During subproject construction, the civil works contractor will arrange temporary storage space for staging and storing project materials and equipment (QEII park and government allocated land). Such temporary arrangements will be voluntary, and the contractor will return the land to its owner/occupier in its original condition.

57. As agreed during stakeholder consultations with the Funafuti Land Council, the Funafuti Kaupule and the Funafuti Land Council Community meetings, stakeholders agreed that all the construction of the main water supply piped network and metered connections will be located within the road easement, which is land already acquired by the Government for the roads in Funafuti, see letter from Funafuti Kaupule at Attachment A. The general arrangements for the main water supply pipelines and services are shown in Figure 12.

Figure 12: Typical Main Water Supply Pipeline and Service Connections

Typical pipeline route mapping

Typical service connection



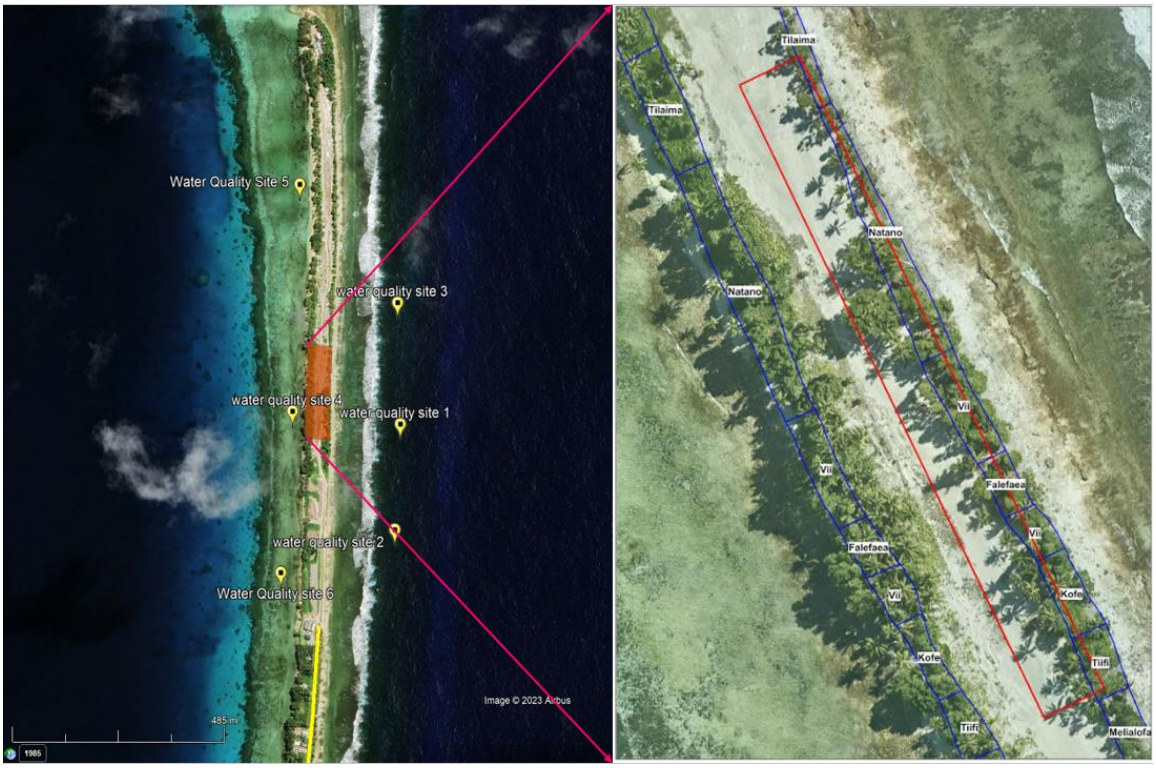
58. As also agreed during stakeholder consultations with the Funafuti Land Council, the Funafuti Kaupule and the Funafuti Land Council Community meetings, stakeholders agreed that the PWD/WSD Water Supply Service Agreement, for a domestic household, commercial property, and or Government of church institution will require the customer to assume full responsibility for the route of their service pipe from the water meter to the building plumbing or water tank. The project will provide the materials suitable for the construction of a number of these service connections for PWD/WSD plumbing staff (around 200) and PWD/WSD or any other licensed and approved plumber will then continue to provide this service for further service connections. The location of these service connections will be photographed and recorded for PWD/WSD data records, but no land acquisition will be required for these service connections.

59. Also, during the subproject construction, the civil works contractor (or PWD/WSD on their behalf) will arrange with relevant householders throughout the Funafuti urban area any temporary closure of streets, roads, and sidewalks/pavements. These closures will be required for the contractor to undertake excavations, pipe laying and construction works required to build the water supply piped network. The contractor will be required to submit a Traffic Management Plan for approval by PMU detailing the notification process and community/traveler information required for such temporary closures. Around commercial properties and businesses, the civil works contractor will be required to provide walk-in access for all customers and minimize the closure of access for vehicles (trucks, cars, and motorcycles).

J. Component 2 - Public sanitation service

Septage Dying Beds, Package Wastewater Treatment Plant and Septage Treated Effluent Ocean Outfall

Figures 13 and 13: Location of Septage Drying Beds, Primary Waste Water Treatment Plant and Effluent Ocean Outfall



60. It is proposed that the new sanitation treatment be located towards the northern end of Fongafale Islet adjacent to the existing solid waste dumpsite, and the current septage disposal pits that is used by PWD. This public, unlined dumpsite and septage pits operate six (6) days a week and is managed by the Waste Management Department (WMD) of the Ministry of Local Government and Agriculture (MLGA). The new septage treatment facility is proposed to be located some 100 metres to the north-east of the fenced dumpsite.

61. The current septage disposal practice will continue to be used whilst the new sanitation facilities are constructed and commissioned and made operational. The old septage disposal site will be pumped-out to the septage beds and the site cleaned-up. It will then be incorporated into the fenced area to be managed by WSD/PWD. As part of this site development, the road will be moved a few meters towards the west to provide accessway to the northern tip of the island by the locals.

62. A map and photographs of the proposed site are provided in **Error! Reference source not found.**14. As discussed with the landowner, the project shall move the road to a new alignment further left of the centre of the island so the modular septage drying beds and WWTP can be fitted into a narrow area to the ocean side of the re-aligned road. The project shall be careful to retain all important foreshore vegetation on both the ocean and lagoon sides of the island.

63. The type of construction planned for the septage drying beds and the WWTP are extremely modular and flexible so during PRF Phase 2 – Detailed Engineering Design the layout will be planned to ensure minimal impact upon all important foreshore vegetation.

64. The site selected for the construction of the new sanitation facilities is expected to require land approximately 18 to 25 metres wide by 160 metres long, which will also include this present PWD/WSD septage disposal site. This site will continue to be used whilst the new sanitation facilities are constructed and once commissioned and operating the old septage disposal site will be pumped-out to the septage beds and the site cleaned-up. It will then be incorporated into the fenced area to be managed by PWD/WSD.

65. Further photographs showing the importance of the foreshore vegetation, which must be retained are shown in Figure 15.

Figure 14: Important Vegetation to be Retained Along the Coastline, Both at the Lagoon and Ocean Side

		
General view looking north.	Ocean foreshore vegetation	General view looking south to existing dumpsite

66. There is a recreation area approximately 750 meters to the north of the site that is reportedly popular with locals in this area. This is also unaffected. However, the road leading to this spot passes by the sanitation facilities area, and there is potential for human activity such as fishing and other recreation to occur in the vicinity of the site as there is no signage informing people about the purpose of the site and its infrastructure. Realignment of the exiting road will be incorporated in the sanitation facility design to allow access to these recreational facilities and houses further north by the locals. Signage should be erected on the site boundary to explain the danger of fishing and collecting seafood near this site.

67. Baseline water quality samples will also be taken around the outfall site, as well as the area in the lagoon which is used for recreational purposes. Subsequent guidelines will be developed by the PWD/WSD using WHO and FAO standards which can be adopted to monitor and disclose to the public for safety. These guidelines will be developed by the government of Tuvalu, mainly the Ministry of Health and PWD.

68. The existing trees and coastal littoral vegetation (with a minimum 5m buffer) along the foreshore area will be retained to ensure natural coastal protection during the construction of the sanitation facility. These include the coastal littoral forest and scrubs which are mainly dominated by Niu (*Cocos nucifera*), Fala (*Pandanus tectorius*), Pua (*Guettarda speciosa*), Kanava (*Cordia subcordata*), Fetau (*Calophyllum inophyllum*), Nonu (*Morinda citrifolia*), Fue kena (*Ipomoea macrantha*) and Gasu (*Scevola taccada*). Grass, namely *Lepturus repens, Stenophrum micranthum* and *Thuarea involute* are also found in patches along the coastline and within the site.

Septage containment tanks

69. Almost every house and commercial/government offices and buildings in Funafuti have an OSTDS (water flush toilets attached to a septic tank and drainage field). The construction of these septic tanks has not been regulated by the National Building Code of Tuvalu or checked/monitored by PWD, so many systems do not work as designed and more recently most are being affected by sea level rise, spring (king) tides, storm surges, and simply land based flooding from more intense rainfall events. When these facilities leak, polluted stormwater, flood waters, and seawater, the communities, public health is placed at risk. These situations lead to adults and/or more particularly school children wading through polluted waters to gain access to or to leave their house.

Figure 15: Types of Septage Containment Tanks

Septage Holding Tank for underground installation

Concrete Septage holding Tank for underground installation

Note: No internal baffle wall for containment tank

On-site constructed concrete block and mortar septage tank – NIWA, Fiji

70. It is essential to ensure that the piped systems and containers capturing and storing human excreta be water-tight and do not allow the entry of stormwater, flood waters, and seawater into the container nor the leakage of any septage (liquids or solids) out to the environment. These septage containers can be manufactured off-site in plastic or concrete materials and should be tested and certified by the manufacturer for water tightness before sale.

71. Suitable septage containers may also be constructed on-site utilizing concrete block and a concrete mortar plaster construction method with sealable access lids. These vessels constructed on-site, usually by a local contractor, should also be tested by PWD with a pressure pump for water tightness. Some examples of these products are shown above. WSD/PWD will be required to certify each installation to see that it complies with the Draft National Building Code of Tuvalu.

72. It is proposed that the local construction of septage containment tanks be initially trialled as a pilot scheme to ensure that watertight structures can be constructed, and then water tested for leakage. Also, under this pilot a service arrangement for the householder will be agreed to for WSD/PWD pump-out their septage container around every 4 to 6 months, dependent upon the number of people residing in the household. This will not include works to rehabilitate existing septage tanks to meet the standards required to the specification of the pilot septage tanks. Normal septage pump out charges will apply, and greywater (laundry, kitchen, and bath water) should not be plumbed for drainage to these facilities. They should only collect blackwater from water flush toilets.

73. Commercial, Government properties and households will be expected to construct their own septage capture and storage facilities using their own financial resources and again WSD/PWD will be required to certify each installation.

74. All these septage containment tanks will only be constructed at the landowner's/lease holder's cost on their household site or business/commercial enterprise site. A scheme to assist vulnerable, poor households fund these facilities will be investigated.

75. The sanitation subproject will also provide additional septage transport (tanker trucks) for PWD/WSD.

II. POLICY, LEGAL, AND ADMINISTRATIVE FRAMEWORK

A. Tuvaluan Government Environmental Laws and Regulations

76. **Institutional arrangements for environmental protection**. The DOE, which is based in Funafuti, is overseen by a director. It has a staff of four, including an Environment Impact Assessment (EIA) specialist, two environmental officers, and a librarian. It does not have offices or personnel in the outer islands and limited capacity to provide environmental compliance monitoring of the projects during the construction phase. As part of the original project, the South Pacific Regional Environmental Program (SPREP), which currently has existing capacity building capabilities in EIA, has been contacted regarding providing relevant training of staff within DOE.

77. The Government of Tuvalu EIA requirements as outlined in the Environmental Protection Act 2008 – EIA Process and the EIA Amendment Regulations 2017 have also been considered during this initial environmental examination of the core components and must be approved by GoT before project construction commences. These documents have been provided at Appendix A.

78. The PRF consultant will complete the GoT EIA application as part of the FWSSP PRF Phase 2 activities to be undertaken in Q3 and Q4 2023. At this Phase 2 stage, the final layout of project infrastructure will have been made with PWD/WSD and mapped for the ensuing civil works procurement plan packages.

79. **Policy framework.** Government policy on environmental protection is expressed in the National Environmental Management Strategy (NEMS)[11], which presents a long-term approach to dealing with environmental management issues to assist in efforts to achieve sustainable development. The key objectives of NEMS are to ensure sustainability of development by (i) integrating environmental considerations into economic development, (ii) improving environmental awareness and education, (iii) balanced development and planned urbanization, (iv) improving waste management and pollution control, (v) protecting natural resources and (vi) environmental monitoring. This sets the framework for the requirement of projects to undergo an environmental assessment process prior to approval and to commencement of any development.

80. **Legal framework.** The principal law governing the protection and management of the environment is the Environmental Protection Act 2008 and, specifically, Part V – Environmental Impact Assessment outlines the requirements and provisions for environmental impact assessment and monitoring of environmental impacts. This legislation was further strengthened with the Environment Protection (EIA) Regulations 2012 made under Section 39 of the

[11] SPREP. 1997. Tuvalu: National Environmental Management *Strategy* (Apia, Samoa).

Environment Protection Act 2008, which sets out the process for undertaking environmental impact assessments, and the EIA Amendment Regulations 2017.

81. The DOE is responsible for the administration and enforcement of the Environmental Protection Act 2008 and the Environment Protection (EIA) Regulations 2012 (as amended). The DOE has responsibility under the legislation for reviewing, assessing and monitoring projects.

82. The procedures for undertaking environment impact assessment under the Environment Protection (EIA) Regulations 2012 (as amended) include for a preliminary environmental assessment report (PEAR), or an IEE, to be prepared for all development projects in accordance with Regulation 8, and a full EIA be prepared for activities with significant impacts, as identified in the PEAR or IEE.

83. A PEAR will include *inter alia* an assessment of all reasonably foreseeable adverse and positive impacts, including long-term and short-term, primary and secondary consequences and an indication of measures that the proponent intends to take to mitigate or avoid identified adverse impacts. DOE will review the PEAR and prepare a report for the Minister. The Minister will consider the preliminary report and the recommendations provided by the Director of DOE.

84. If the DOE confirms that a project will not cause any significant adverse impact to the environment and has complied with the requirements of Regulation 8, the Minister may give written approval to the project based on the preliminary report. The DOE and a proponent can also agree that an EIA is required for a major project at any time prior to or during the preparation of a preliminary report. If, after a review of the preliminary report, DOE confirms the project will cause significant adverse impacts to the environment, then the Minister may give notice in writing to the proponent that an EIA is required.

85. All EIA reports are submitted to the Director of DOE who arranges for a review of the report to be undertaken by DOE, or by an external review in accordance with Regulation 15 if DOE does not have the necessary specialist skills to appropriately review a full EIA or any specific parts of an EIA. All EIA together with the report of the review by the DOE and a report of public consultations (if any) shall be referred to the Environmental Assessment Task Force for consideration.

86. The Minister may give written approval to any project based upon a full EIA which has complied with the requirements of Part IV, and which the Task Force has reviewed in accordance with Part V. The Task Force may also recommend to the Minister that a proposed major project be refused permission to commence or continue due to the unacceptable environmental impacts of the potential or existing project.

Standard conditions:

- The proposed development shall be in accordance with the approved plan(s) that has been submitted with the IEE and CEMP to the DOE.
- The approved plans shall not be modified or altered without the prior written approval of the DOE.
- The proponent shall prepare a CEMP and submit this to the DOE prior to commencement of construction which addresses how the applicant will deal with all relevant environmental matters, for example:
    - cultural and heritage management;
    - flora and fauna management;

  - storage and use of hazardous materials;
  - weed management;
  - waste management;
  - water and soil management;
  - air quality management (including dust suppression); and
  - environmental incident reporting and management procedures.

- Prior to the commencement of site works, a Waste Management Plan (rubbish collection, recycling, hazardous waste) and Spill Management Plan shall be submitted to the DOE.
- In-water work is not to be undertaken during bad weather and minimized during the cyclone season.
- The proponent must provide regular weekly reporting on the environmental performance of the development and train local community member(s) to complete monitoring activities and assist them to complete monitoring and reporting activities.
- The proponent must supply the DOE with any modelling and raw data collected during the IEE.

Proposal-specific conditions:

- There shall be a minimum impact to the ecological community (i.e. coconut crab, kanava tree, endemic *vili* lizard and frigate bird) on site.
- The proponent shall implement sediment control measures and provide a methodology for dredging, to include only completing construction activities on outgoing tide to reduce impacts to the reef flat.
- The proponent shall undertake coral re-planting on site to mitigate impacts on any coral disturbed by the works.
- The proponent shall implement weed/pest control to ensure that the spread of invasive species is minimized.
- The proponent shall undertake vegetation planting in the area near the terminal to mitigate any vegetation disturbed and habitat loss.
- If any item or object of heritage significance or unexploded ordnance (UXO) is identified all work in the vicinity of the item or object must cease immediately and the DOE must be contacted.
- **Other relevant legislation**. Under the Foreshore and Land Reclamation Act the State owns the foreshore and seabed. This is subject to public rights of navigation, fishing and passing over the foreshore, as well as any private rights which may exist. Section 3 (2) of the Act also gives authority to the Kaupule (council of elders) on each island specifically for licensing people who wish to remove anything from the foreshore. No person shall remove from the foreshore of any part of Tuvalu any sand, gravel, reef mud, coral or other like substances without having first obtained from the Kaupule in whose area of authority such foreshore lies, a license for that purpose.
- The Conservation Areas Act 2008 makes provision for the declaration and management of conservation areas. The Minister may declare any part of the territory

of Tuvalu as a conservation area upon the request of a Kaupule and after due consultation with the Kaupule recommending the establishment of a conservation area. The objective of the conservation area is to protect the coastal, marine and terrestrial environment and preserve the biodiversity.

- The Biosecurity Act 2017 makes provisions for the declaration and clearance procedures of construction equipment's and materials; prohibited items; import procedures brought in by vessels. The contractor is advised to ensure all requirements are met and is when bring in construction materials and equipment's to Tuvalu. The Act explicitly outlines the level of penalties for various types of offence under the Act.
- Pesticides Act 1990 is an Act to control the importation and use of pesticides. The Act provides that no person shall supply, sell, offer for sale or use any pesticide in Tuvalu which is not registered under the Act.
- The Marine Resources Act 2006 is the main law dealing with fisheries in Tuvalu and makes provisions for the promotion and regulation to ensure the long-term conservation and sustainable use of the living marine resources for the benefit of the people of Tuvalu. The Marine Resources Amendment Act 2012 implements changes to the principal act which are intended to ensure that Tuvalu's international, regional and national rights and responsibilities in relation to fisheries conservation, management and development are accommodated. The Amendment significantly increased the level of penalties for various types of offence under the Act.
- The National Disaster Management Act (revised 2007) provides a provision that the National Disaster Committee (NDC) is an advisory and coordination body for disaster mitigation, preparedness, response and recovery. The Tuvalu Climate Change Policy 2012 emphasized sea level rise is a direct threat to lives, assets, livelihoods and ecosystem capacity, exacerbated by the fact many areas were dug up during World War II.
- Employment Act 2006. This Act outlines the requirements of the employer as they act towards their staff. In the context of the FWSSP there are several aspects which are noteworthy. Firstly, the employer requires a recruitment license when: (a) the employer employs more than 25 people at one time; or, (b) the workers are to be recruited from more than 25 miles from the place of work. The issuance of this license is to enable the GoT to consider the impact of removing a number of adult males from their home area for the duration of employment. The application for this license requires detailed information on the health, safety and welfare of the employees. Secondly, section 43 of this act states that no person shall recruit a worker under the apparent age of 18. The Commissioner may grant permission to employ persons from 15 years of age with parental or guardian consent for employment in Tuvalu for light work duties. The act also stipulates the maternity arrangements for female employees, including 12 weeks paid maternity leave with at least 25% of her regular salary. The act also makes provisions for the allowance of twice daily breaks to breastfeed any nursing babies. This act also protects women from dismissal for absences relating to pregnancy complications, unless this absence exceeds 12 weeks.
- Part XI of the act provides for the care of workers and details the legal requirements governing the following: rations, water, sanitary arrangements, housing, medical care and treatment, hospital maintained by the employer, conveyance of workers by sea and reporting of deaths

87. Waste Operations and Services Act 2009. The Regulations state that after review of the full assessment, the DoE may issue instructions for the proponent to undertake consultations and may provide full details for the proposed consultations process. This Act, in combination with the EPA, gives the DoE responsibility for the waste regulations in Tuvalu and the regulatory control of waste management operations. The DoE is also responsible for implementing the international conventions relating to the management of hazardous wastes. Additionally, the regulatory control of waste dumps and waste disposal sites shall be exercised by the DoE in relation to environmental impact assessment and the imposition of standards, and the designated waste management operators relating to the management of wastes. The Act states that waste dumps and waste disposal sites shall be managed by each Kaupule or the Solid Waste Agency where the need exists for additional technical and operational capacity for the proper disposal of wastes. In the context of MICRO, as no waste will be permitted to be dumped on Nanumaga, the SWA will be an important stakeholder in the waste management plan. The storage and disposal of hazardous wastes shall be undertaken by the SWA. Regulation 12 of the Act states that all landfill sites, waste dumps and waste disposal facilities in Tuvalu must be licensed by the SWA.

88. The Climate Change Resilience Act 2019 is committed to: Section 8 (f) cooperate in preparing for adaptation to the impacts of climate change, and develop and elaborate appropriate and integrated plans for coastal zone management, water resources and agriculture, and for the protection and rehabilitation of areas affected by drought and desertification, as well as sea level rise and floods; Section 8 (g) take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change.

89. COVID-19 (Threatened Emergency) Regulation 2021 makes provisions for the management, control, monitoring and protection of people from the effects of COVID-19, closure of borders, conditions of entry of people, ships, planes or vessels, conditions for quarantine person, quarantine areas and restrictions, Food security, repatriation and relocation, restrictions of public meeting, gathering and assembly, essential services, transshipment procedures and penalties.

90. Te Kakeega III (TKIII) (2016) highlighted that climate change poses the most serious threat to the security and survival of Tuvalu. It is the prospect of warming temperatures, sea level rise, and severe weather events overhang the entire discussion of future development. Urgent action in response to climate change impacts is needed both at the local and global level.
Each inhabited island has a council of elders, or fale kaupule, who are responsible for running the affairs of the island. The fale kaupule cooperates with the national government on matters relating to the island and on matters of custom.

91. The Falekaupule Act 1997 (amended in 2000) empowers Kaupule to provide for the improvement and control of fishing and related industries in accordance with the Fisheries Act and to prohibit, restrict or regulate the hunting, capture, killing or sale of animals, reptiles, birds or fish in accordance with the Wildlife Conservation Act 1975 (amended 2008).

92. This act governs the establishment and composition of a Falekaupule and a Kaupule as well as their meetings, proceedings and functions. The act states that the Kaupule on each island shall be the executive arm of the Falekaupule and shall perform all of the functions conferred on

the Falekaupule by this or any other Act and generally maintain order and good government and promote development within the area of its authority.

93. The Act also states that the with the express approval of the Falekaupule (and the Minister for lands outside the Falekaupule area) a Kaupule may, for the purposes of performing its statutory functions or those of the Falekaupule, acquire by purchase, gift or lease any land within or outside the Falekaupule area.

94. The Act determines that each March, and at 3 monthly intervals throughout the year an assemble of all residents of the Falekaupule area will be held to discuss treasury matters, local development plans and any other matters. Under the act, there is a local development plan for each Falekaupule which will set out programs and priorities for social and economic development for that area. The local development plan shall be reviewed each year by the Falekaupule Assembly.

95. Schedule 3 of the Act details the functions of the Falekaupule in specific regard to: (1) Agriculture, Livestock and Fisheries; (2) Building and Town or Village Planning; (3) Education; (4) Forestry and Trees; (5) Land; (6) Relief from Famine or Drought; (7) Markets; (8) Public Health; (9) Public Order, Peace and Safety; (10) Communications and Public Utilities; (11) Trade and Industry; and, (12) Miscellaneous. In the context of FWSSP, some of the specific functions to note at this stage are:

- to regulate and control by byelaws the erection and construction, demolition, re-erection and reconstruction, conversion and re-conversion, alteration, repair, sanitation and ventilation of any public or private building or structure.
- to prevent and control erosion of land by the sea or other cause.
- to safeguard public health and promote public health, including prevention and dealing with any outbreak of the prevalence of any disease in accordance with the Public Health Act.
- to prevent the pollution of any water, and by byelaws to prevent access to any polluted water.
- to make, alter, divert, and maintain roads, streets, parking, paths, culverts; causeways, bridges, drains and watercourses.
- to make alter and maintain wharves and jetties.
- to erect and maintain navigational aids in conjunction with the Government in accordance with the Harbours Act.
- to establish, acquire and maintain transport services by land or water, including ferries.
- to regulate or prohibit by byelaws the planting, cutting or destruction of trees or vegetation growing along any street, road, path or in any public place.
- to establish, maintain and provide information and publicity services.

96. Harbours Act (1657 CAP 48.08). The Harbours Act states that the Minister shall declare any harbour and shall define, by notice, and may by notice vary, the limits of any harbour. The

Act also governs the maintenance and construction of harbours. The Minister may license and permit any part of the tidal lands and waters of a harbour to be used or occupied for the erection of and use of any boatshed, landing-place or wharf. It is a requirement of the Act that any licensed areas for new harbour construction be lighted. It is an offence to erect or construct a wharf in any harbour or any other place in Tuvalu or encroaches in any way on the waters of any harbour without having first obtained a license and a permit to do so from the Minister. Public Health and Safety Regulations (Revised 1990). These regulations set out the required standards in and around villages for maintaining public health. In relation to MICRO, the following regulations are applicable:

- No stagnant water shall be allowed to lie in such lands for more than 24 hours unless treated to the satisfaction of a sanitary inspector by efficient drainage or with petroleum or other suitable oil.
- No tins, bottles or receptacles capable of holding water shall be allowed to remain upon any such premises or land.
- All tanks, vats and vessels used for retaining water shall be efficiently covered with mosquito proof gauze or shall be treated with petroleum or other suitable oil to the satisfaction of a sanitary inspector.
- No person shall deposit or cause to be deposited any empty tin, bottle or other receptacle in any street road or public place.
- Every house or building in daily occupation shall be provided by the owner thereof with latrine accommodation approved by the sanitary inspector.
- All garbage and rubbish which can be readily destroyed by fire shall be so destroyed; and all other garbage and rubbish shall be placed in tins and covered with fly proof covers, and such tins shall be placed daily in positions convenient for collection.

97. Foreshore and Land Reclamation Act. Under the Foreshore and Land Reclamation Act the State owns the foreshore and the seabed. This is subject to public rights of navigation, fishing and passing over foreshore as well as any private rights which may exist. Section 3(2) of the Act also gives the Kaupule on each island specifically for the purpose of licensing people who wish to remove anything from the foreshore. No person shall remove from the foreshore any part of Tuvalu sand, grave, reef mud, coral or other like substances without first having obtained from the Kaupule in whose area of authority such foreshore lies, a license for that purpose

98. International agreements and conventions. Tuvalu has ratified numerous environment-related international and regional commitments and remains in general compliance with the spirit of such commitments (see Table 2.1).

Table 2.1: International Conventions and Treaties Tuvalu has Ratified

Year	Convention or Treaty
1972	Prevention of Marine Pollution by Dumping of Wastes and Other Matter (London Convention)
1973	All IMO conventions and protocols relating to the prevention of pollution from ships
1982	United Nations Convention on the Law of the Sea (UNCLOS)
1982	Cooperation in the Management of Fisheries of Common Interest (Nauru Agreement)
1985	South Pacific Nuclear Free Zone Treaty (Rarotonga Treaty)
1985	Vienna Convention for the Protection of the Ozone Layer

Year	Convention or Treaty
1986	Protection of Natural Resources and Environment of the South Pacific Region and Related Protocols
1987	United States Multilateral Fisheries Treaty (as amended)
1987	Montreal Protocol for the Vienna Convention
1989	Basel Convention - Control of Transboundary Movements of Hazardous Wastes and Their Disposal
1989	Convention on the Prohibition of Fishing with Long Drift Nets in the South Pacific
1990	London Amendment to the Vienna Convention
1992	Rio Declaration on Environment and Development
1992	United Nations Framework Convention on Climate Change (UNFCCC)
1992	United Nations Convention on Biological Diversity (CBD)
1992	Copenhagen Amendment to the Vienna Convention
1993	Niue Treaty in Fisheries Surveillance and Law Enforcement
1993	United Nations Chemical Weapons Convention
1994	United Nations Convention to Combat Desertification
1995	Waigani Convention – banning importation, controlling and managing hazardous and radioactive waste within the South Pacific Region
1995	Amendment to the Basel Convention
1997	Kyoto Protocol to the UNFCCC
1999	Basel Protocol on Liability and Compensation for Damage to the Basel Convention
2000	Cartagena Protocol on Biosafety to the CBD
2001	Stockholm Convention on Persistent Organic Pollutants (POPs)
2004	Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific (Tuna Convention)
2016	Paris Agreement to the UNFCCC

B. ADB Safeguard Policy Statement (SPS)

99. The goal of the ADB's SPS[12] is to promote the sustainability of project outcomes by protecting the environment and people from any potential adverse impacts of the project.

100. This environmental assessment of the proposed sub-projects has been undertaken in compliance with ADB's SPS 2009. This policy ensures that potential adverse environmental impacts are identified and avoided where possible, and that identified risks are managed or mitigated. The objective of requirement 1 of the SPS is to ensure the environmental soundness and sustainability of projects and to support the integration of environmental considerations into the project decision-making process.

101. The objectives of the SPS are to: (i) avoid adverse impacts of projects on the environment and affected people, where possible; (ii) minimize, mitigate, and/or compensate for adverse project impacts on the environment and affected people when avoidance is not possible; (iii) help borrowers/clients to strengthen their safeguard systems and develop the capacity to manage environmental and social risks.

[12] ADB. 2009, Safeguard Policy Statement (Manila, Philippines)

102. The SPS contains three safeguard requirements; SR1: environment, SR2: involuntary resettlement, and SR3: indigenous peoples. Each of the safeguard requirements comprises an objective, scope and triggers, and a set of policy principles that must be met. Each of the safeguard requirements follows a due diligence process of screening, categorization, scoping, consultation, impact assessment, management, and monitoring and reporting. Documentation of the due diligence is subject to disclosure as per the requirements of the Public Communications Policy 2011.

103. ADB will not finance projects that do not comply with the SPS and the host country's social and environmental laws and regulations, including those laws implementing host country obligations under international law. The SPS also contains a prohibited activities list identifying specific activities that ADB will not finance.

104. As per SR1, the project has been screened as category B, i.e. its potential adverse environmental impacts are less adverse than those of category A projects. These impacts are site-specific, few if any of them are irreversible, and in most cases mitigation measures can be designed more readily than for category A projects. This IEE identifies as far as practicable the various components of the project, assesses the potential adverse environmental impacts and identifies the measures required to mitigate or minimize them, and includes these in the EMP.

III. DESCRIPTION OF THE ENVIRONMENT (BASELINE DATA)

A. Physical Environment

105. Tuvalu consists of six coralline atolls (Nanumea, Nui, Nukufetau, Funafuti, Nukulaelae, Vaitupu), and three table reef islands (Nanumaga, Niutao, Niulakita) with a total land mass of some 26 km^2 spread across an economic zone of 757,000 km^2.

106. **Topography and geology.** The islands of Tuvalu are very low-lying with an average height of 2m above sea level. Like other coral atolls and islands, the soil is derived from limestone which results from coral formation over thousands of years. Funafuti is the largest atoll in Tuvalu with its long-axis stretching for about 25km in length and 18km in width across the center at its widest points. It is 1.42 km^2 in area and has functions of a capital city of Tuvalu with an international airport and seaport. Fongafale islet is a long and narrow strip of extremely low elevation with a broad "V" shaped outline. Rubbles of dead coral are piled up at ocean-side fringe of the islet up to 4 m above sea level, making the highest points of the islet. Other areas are below 2 m above sea level in large portion of the islet which provided residential area for long time inhabitants, namely, Alapi and Senala villages. Fongafale islet can be divided into three geographical areas, namely, the south part (or arm) extending southwestward approximately 2.5 km from the south end of the runway; the central area from the south end of the runway north approximately 2 km to Teuaea road and; the north part (arm) extending northeastward approximately 4.5 km from Teuaea road. There are approximately a total of 33 islets sitting atop the atoll rim can be generally categorized into two different types; (i) cays composed of unconsolidated coral rubble and calcareous sand, and (ii) larger islands, also known as motu, where similar unconsolidated deposits are underlain by cemented coral-rubble extending upward into the modern supratidal zone[13]. The islets and reef flats on the eastern half of the atoll provide a barrier to the prevailing easterly trade winds and wave energy entering the lagoon, while those on the western and northern parts are exposed and widely spaced out at average distances of

[13] *Dickinson, W. R. (1999). Holocene Sea-Level Record on Funafuti and Potential Impact of Global Warming on Central Pacific Atolls. Quaternary Research, 124-132.*

3km.[14] Topographic features commonly found on the atoll of Funafuti include; ocean ridges, lagoon ridges, central depression, interior flats and ridges, and borrow pits[15].On the windward side of the atoll, ocean ridges are often made up of gravel, whereas leeward and lagoon ward ridges are mostly sand. A central depression usually occurs between oceanward and lagoon ward ridges[16]. Ocean ridges also reach higher elevations than lagoon shores, but the highest point on many of these islets are found on spoil from the excavation of pulaka pits. Depths in the lagoon vary from 1m to 2224m on the deeper margins of the atoll edifice flank. The nearshore bathymetry of Funafuti is more complex than other atolls in Tuvalu. A near continuous shoreline parallel terrace and break in slope in water depth of 100-150m is observed approximately 100-450m seaward of the modern reef. [17]

107. **Soils**. The soils of Tuvalu are defined as Calcaric Regosols which are very weakly developed soils on a highly calcareous parent material. These include exposed limestone rock, beach or reef rock, unaltered sand and gravel, light soils, dark sands, phosphatic soils, saline soils and soils created in pulaka pits. They are normally characterized as being shallow, porous, alkaline, coarse textured, nutrient deficient, with a carbonate mineralogy and high pH reading (8.2-8.9).these soil can be described as foraminifera and coralline rich sand with occasional coral fragments. Tuvalu is geologically very young, with most of its islands having poorly developed sandy or gravel coralline soils. Soils range from 250-1000mm in depth, generally low in fertility and have limited potential for agriculture production being typically deficient in most of the important nutrients needed for plant growth (e.g. nitrogen, potassium and micronutrients such as iron, manganese, copper and zinc). The island landscape is inherently dynamic, with erosion and accretion of sands along the coastal margin being common features on all the islands, especially during tropical cyclones associated with high seas and storm surges

108. **Seismicity**. Tuvalu is situated in a relatively quiet seismic area but is surrounded by the Pacific “ring of fire,” which aligns with the boundaries of the tectonic plates. These tectonic plate boundaries are extremely active seismic zones capable of generating large earthquakes and, in some cases, major tsunamis that can travel great distances. No significant earthquakes have been observed in recent history. However, in 1899, a large earthquake off the eastern coast of New Ireland, Papua New Guinea generated a large tsunami that resulted in destructive waves at Nukufetau atoll and a significant historic seismic event was a magnitude 7.0 earthquake recorded in 1907.[18] The World Bank Country Risk Profile concludes that Tuvalu has a 40% chance in the next 50 years of experiencing, at least once, weak levels of ground shaking.[19]

109. **Coastal processes**. Hindcast modelled wave data offshore of Tuvalu (deep ocean waves) indicates that the offshore non-cyclonic wave climate is predominantly driven by the south-east trade winds and long period south-westerly swell waves from the Southern Ocean. The wave climate information shows that waves predominantly come from the east to the south-east (~25% occurrence) and can exceed 3 m significant wave height (Hs) at times. There is also a significant occurrence of long distance swells coming from the south-west which typically have higher periods.

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[14] McLean, R. F., & Hosking, P. L. (1992). TUVALU LAND RESOURCES SURVEY: FUNAFUTI. Auckland: United Nations Food and Agriculture Organization.

[15] Hosking, P. (1991). GEOMORPHOLOGY OF REEF ISLANDS AND ATOLL MOTU IN TUVALU. South Pacific Journal of Natural Sciences, 167-189.

[16] Woodroffe, C. D. (2008). Reef-island topography and the vulnerability of atolls to sea-level rise. Global and Planetary Change, 77-96.

[17] Krüger, J. (2008). High-Resolution Bathymetric Survey of Tuvalu. Suva: Pacific Islands Applied Geoscience Commission.

[18] *AIR Worldwide Corporation. 2008. Pacific Catastrophe Risk Financing Initiative, Country Risk Profile Tuvalu (Funafuti, Tuvalu)*

[19] *World Bank. 2011. Pacific Catastrophe Risk Assessment and Financing Initiative: Tuvalu Country Risk Profile (Washington D.C, US)*

110. **Barometric Pressure.** The standard atmospheric pressure at sea level is taken as 1013.25 hectoPascals (hPa) or 1013.25 milibar (mb), but the air pressure at sea level normally varies between about 1040 hPa and 970 hPa. Higher air pressure gives lower sea levels: the expected variation in sea level due to air pressure is between +43 cm and -27 cm around mean sea level.

111. **Tides.** Tidal variations in the area are generally small, with a mean spring tidal range (mean low water springs to mean high water springs) of 1.6 m. Due to the small tides, tidal currents are expected to be small. The governing currents on the reefs are expected to be driven by waves. The island has a fringing reef. The larger waves plunge on the edge of the reef due to the steep drop-off and abrupt change in depth at this location. The tidal range for Funafuti – Tuvalu is set out in Table 2.

TABLE 2: TIDAL RANGE FOR TUVALU

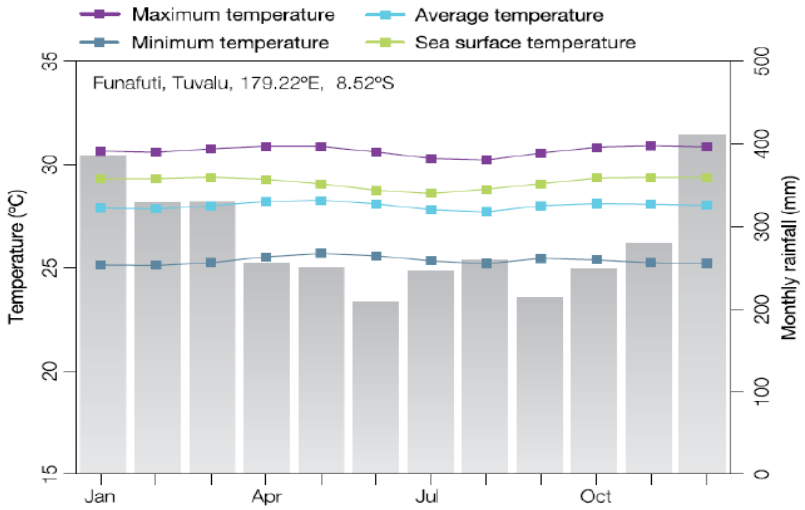
Tidal Plane	Water Level (m to LAT)	Water Level (m to MSL)
Highest Astronomical Tide (HAT)	2.422	1.263
Mean High Water Spring (MHWS)	1.980	0.821
Mean High Water Neap (MHWN)	1.492	0.333
Mean Sea Level (MSL)	1.159	0
Mean Low Water Neap (MLWN)	0.827	-0.332
Mean Low Water Spring (MLWS)	0.338	-0.821
Lowest Astronomical Tide	0.000	-1.159

Source: *Pacific Catastrophe Risk Financing Initiative - Country Risk Profile Tuvalu (2008)*

112. **Climate**. Tuvalu lies within the south-east Pacific trade wind belt just south of the dry belt of the equatorial oceanic climate zone. It is located on the 6th latitude and falls within the western South Pacific tropical cyclone region.

113. The country has two distinct seasons – a wet season from November to April with winds from the west and northwest when strong winds and high rainfall can be expected, and a dry season from May to October (Figure 18) when light southeast trade winds predominate. The predominant wind direction ranges between east-northeast to east-southeast for all islands of Tuvalu.

FIGURE 16: Seasonal Rainfall and Temperature in Funafuti



Source: Pacific Climate Change Science Program – Current and Future Climate of Tuvalu (2011)

114. Tuvalu has a tropical marine climate with consistently uniform temperature ranging from 26°C – 32°C and high humidity. The average annual rainfall is 3000 mm but rainfall can exceed 4000 mm per annum at times, though Tuvalu often experiences droughts because of its location near the Pacific equatorial dry zone. The average rainfall for the period 1942–2005 is 2875 mm per annum. However, rainfall varies from 3500 mm/annum in the southern islands to 2700 mm/annum in the northern islands.

115. The cyclone season, with strong winds and high rainfall, typically falls between November and April with winds coming from the west to north-west. An average of eight cyclones per decade developed within or crossed the Tuvalu exclusive economic zone (EEZ) between the 1969/70 to 2010/11 seasons. Tropical cyclones were most frequent in El Niño years (12 cyclones per decade) and least frequent in La Niña years (3 cyclones per decade). Only three of the 24 tropical cyclones (13%) between the 1981/82 and 2010/11 seasons were severe events (Category 3 or stronger). However, several severe tropical cyclones have caused devastating damage to Tuvalu in recent years.

116. Notable cyclones include Cyclone Bebe in 1972, a Category 3 cyclone, which knocked down 90% of the houses on Funafuti and resulted in flooding due to seawater coming up through the coral to a depth of 1.5 m. In 1990, Category 4 Cyclone Ofa affected Tuvalu and destroyed homes on Niutao, Nui and Nukulaelae. Cyclone Gavin was the first of three Category 3 tropical cyclones to affect Tuvalu during the 1996-97 cyclone season, Gavin hit Fiji on 7 March 1997. As this was a very strong cyclone, the average barometric pressure drop was ~30 hPa and sea level rose by approximately 65 cm (including the effects due to winds), with Cyclones Hina and Keli affecting the islands later in the season. Cyclone Hina was also a severe cyclone. The sea level rose more than 60 cm (including sea level rise due to wind effects) and the average barometric pressure drop was about 35 hPa[20]. Personal accounts confirm that the Gavin and Hina resulted in 2-3 m waves affecting the islands in Tuvalu. In March 2015, Category 5 Cyclone Pam resulted in 3-5 m waves causing significant damage to agriculture and infrastructure on most of the islands in Tuvalu during including deposition of sand and rubble into the reef access channel of Niutao, cutting off access from the island to the open ocean. More recently, Category 4 tropical cyclone Ula affected Tuvalu in early 2016 with 3-4m waves affecting all the islands. Figure 4.3 shows all

[20] Singh. A & Aung T. 2005. Effects of barometric pressure on sea level variations in the Pacific region. The South Pacific Journal of Natural Science, Volume 23, 2005. Retrieve on 25.02.2021 from: https://www.publish.csiro.au/sp/pdf/SP05002

cyclone tracks that passed the proposed project site within a radius of 500km since 1970 based on the IBTrACS database[21]. About 27 tropical cyclones have been identified (8 'true' cyclones and 19 tropical depressions). The red dot indicates the location of the proposed Niutao harbour. Figure 4.4 shows these by year. From January 1970 to April 2020 there has been an average occurrence of 0.54 cyclones a year.

117. Storm surges associated with cyclonic disturbances combined with high tides can result in waves washing over low sections of the atolls. As well as disrupting road access, increasing soil salinity, contaminating groundwater, and enhancing coastal erosion processes, the resulting flooding causes agricultural losses, particularly of taro crops, and damage to buildings. These cyclone-induced storm surges and wave conditions have implications for the design of the harbour. The extreme water level for the infrastructure will be determined through a combination of storm surge and tide levels.

[21] Knapp, K.R., Diamond, H.J., Kossin, J.P., Kruk, M. and Schreck, C. 2018. NCDC international best track archive for climate stewardship (IBTrACS) project, version 4. https://data.nodc.noaa.gov/cgibin/iso?id=gov.noaa.ncdc:C01552#

Figure 17: Project Site and Storm Tracks Within 500km of Niutao Island Since 1970

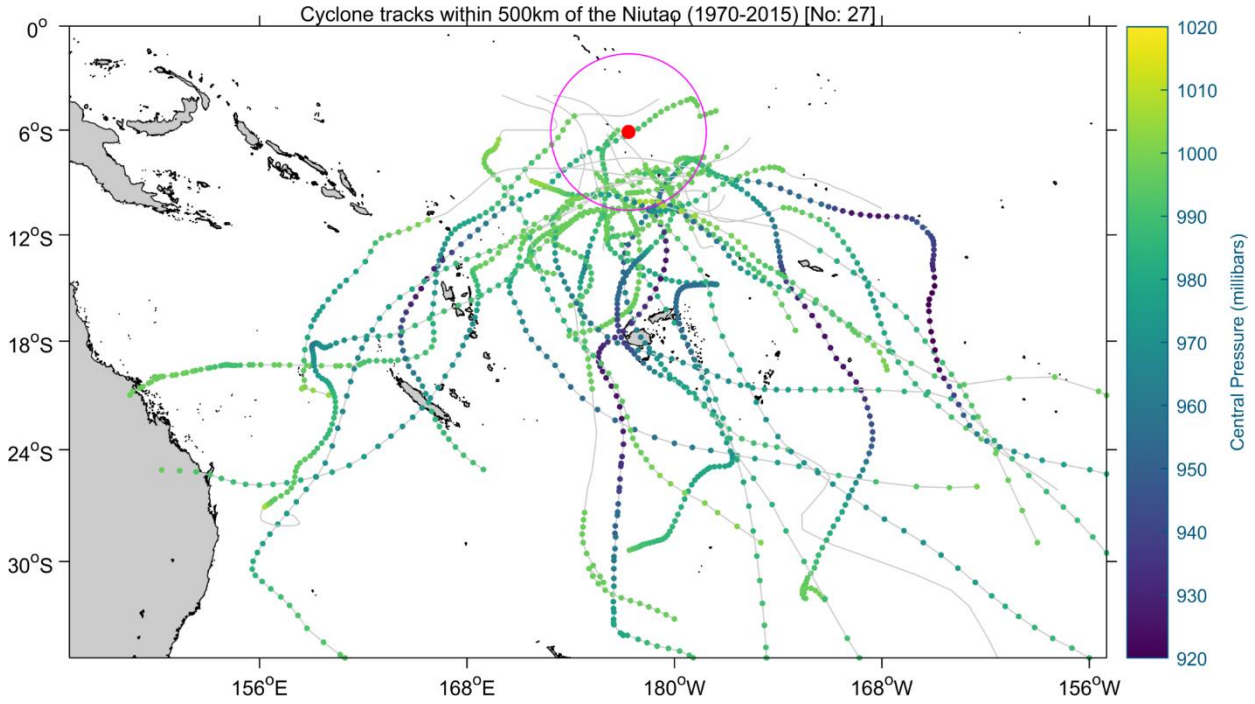
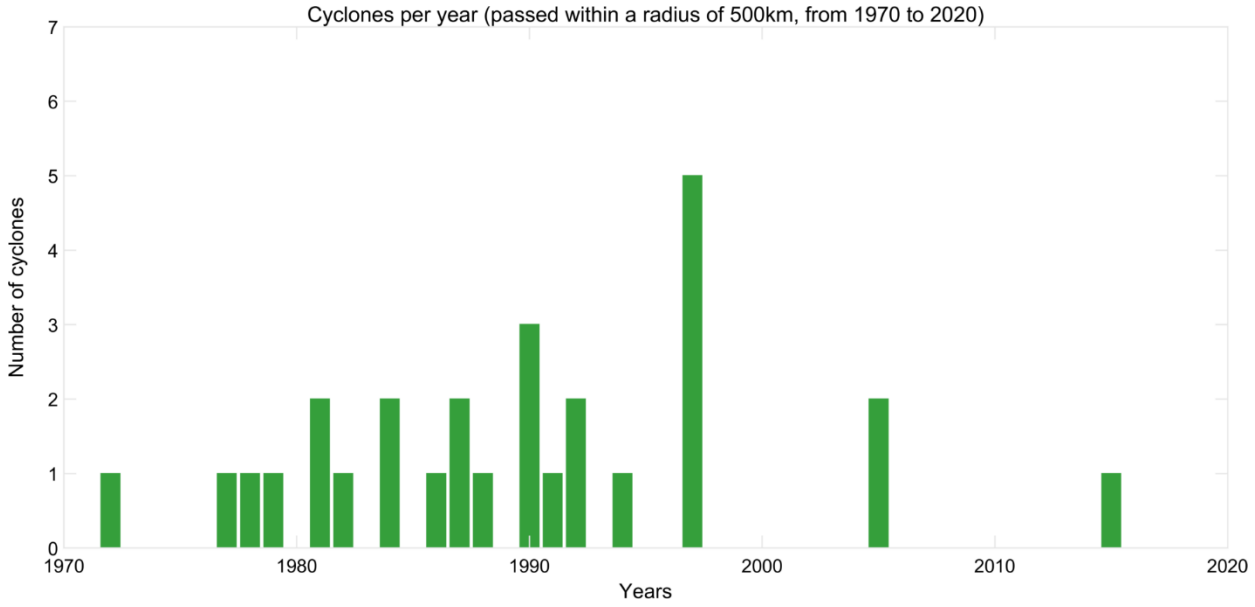


Figure 18: Occurrence in Each Year of Cyclones Within 500km of Niutao Island



118. **ENSO** - During an El Niño, sea level in the eastern Pacific is well above average, while during a La Niña, the increased flow of cold deep water to the surface acts to lower the sea level. In 1982/83 season, the northern Islands of Tuvalu, in particular Nanumea, experienced wetter

than average El Niño and drier La Nina wet seasons and had its two wettest November–April periods on record.[22]

119. **Climate change**. Tuvalu is listed as one of several island groups most likely to disappear beneath the sea in the 21st century due to climate change effects. For the period to 2100, the Pacific Climate Change Science Program of Australia[23] projections and climate science findings indicate:

- Surface air temperatures and surface sea temperatures are projected to continually increase (very high confidence).
- Annual and seasonal mean rainfalls are projected to increase (high confidence).
- The intensity and frequency of extreme heat days are projected to increase (very high confidence).
- The intensity and frequency of extreme rainfall days are projected to increase (high confidence).
- The incidence of drought is projected to decrease (moderate confidence).
- Tropical cyclone numbers are projected to decline in the south-east Pacific Ocean basin (0–40ºS, 170ºE–130ºW) (moderate confidence).
- Ocean acidification is projected to continue (very high confidence).
- Mean sea-level rise is projected to continue (very high confidence).
- The risk of coral bleaching will increase in the future (very high confidence).

120. **Water resources**. For many of Tuvalu's islands, fresher water sits in a "lens" above the saltwater that leeches in through the coral. These lenses are derived from the infiltration of rainwater into the water table below the ground and are formed where the islands are sufficiently wide to reduce the outward flow of the accumulated underground lens. These freshwater lenses are extremely vulnerable to occasional environmental influences. The environment is characterized by small coral atoll islands, where the groundwater table is generally within 1–1.3 m of the surface, and even lower in some parts of Funafuti. Only in limited areas can groundwater be found at depths greater than 2 m. As a result, any pollutants from leaking septic tanks and soak pits moved easily into the groundwater and from the groundwater lens into coastal lagoons. The water sources for the Funafuti water supply are a mix of rainwater harvesting (rainwater collection) and tank, reservoir and cistern storage systems owned and managed by government, communal groups (public buildings, churches, community buildings etc.) and private households.

121. Pollution to water resources in Funafuti were exacerbated by poorly constructed septic tanks; during high tides and heavy rains the septic tanks and soakage pits overflow into adjacent areas. Adding to this problem was a lack of an integrated water and sanitation plan for Funafuti and other islands in the country, a lack of monitoring and enforcement, and an absence of coordination and harmonization of "management" of water and sanitation between national government agencies (Ministries of Health, Public Works, and Environment) as well as the local government (the Kaupule). In addition, there continued to be a rapidly growing population and

[22] Murphy. B.,Power. S. & McGree. S. 2014. The Varied Impacts of El Niño – Southern Oscillation on the Pacific Island Climates. Journal of Climate Volume 27: Issue 11. Retrieved on 25.02.2021 from: https://journals.ametsoc.org/view/journals/clim/27/11/jcli-d-13-00130.1.xml?tab_body=pdf

[23] Government of Australia and Pacific Climate Change Science Program. 2011. Climate Change in the Pacific - Volume 2: Country Reports, Chapter 15 Tuvalu (Canberra, Australia)

limited land space, resulting in septic tanks being located too close to each other, to shallow wells, and to homes.

122. Water quality measurements on the islands indicate that groundwater is heavily polluted with a high bacteria count. Due to the increase in the level of pollution and salinity of ground water sources and, all islands are now predominantly reliant on rain water collected from buildings and houses with iron roofs and stored in concrete tanks above and below ground or more recently in plastic tanks provided by European Union and Government of Australia financed projects.

123. The beach along the lagoon is used by the locals for recreation and currently there are no existing national recreational water quality standards and standards made for effluent discharge. Consultations with PWD identified that the World Health Organization (WHO) and the Food and Agricultural Organization (FAO) for drinking water quality, wastewater and recreational water quality guidelines will be adopted. It is vitally essential that such adopted guidelines be adapted to prevailing epidemiological, sociocultural and environmental local conditions. The baseline studies and other localized studies conducted by Tuvalu Fisheries Department, PWD and the Health Department are essential as they may result in a relaxation of the guidelines and thus augment the quantities of reclaimed water without compromising public health or may result in the need for more stringent standards to protect public health. In either case, such studies are deemed necessary to ensure effective and safe implementation of wastewater reuse guidelines, as this will increase confidence in reclaimed water as a valuable resource.

124. **Coastal resources**. Tuvalu's shallow marine environments consist of intertidal flats, subtidal, inland lagoon areas, subtidal oceanside reefs and oceanic and open water, with mangroves included as both terrestrial and marine ecosystems. Within each of these zones are many combinations of habitat types, including algal flats, coral reefs, channels or reef passes, soft sandy and hard substrates or bottoms and seamounts, each with their own characteristic biological communities. There is no continental shelf seaward of any of the islands and the only substantial areas of shoal water are found within the internal lagoons. These atolls and low coral islands are generally subject to constant change through continuing growth of living corals, erosion and accretion of wave action. Water depths increase very rapidly from the coast to over 1000 m within a few kilometers from the shore or outer reefs.

125. The coastal areas are characterized by white sandy beaches, reef flats, reef patches, lagoons and sea grass beds. These areas contain a variety of habitats, numerous eco-systems and marine organisms. The islands are vulnerable to coastal erosion due to human activity and the effects of tropical cyclones.

126. The practice of mining of beach sand, gravel and other aggregates for construction purposes has significantly affected coastal process and coastal areas on all outer islands. Consequently, the removal of beach gravels and sands is now limited to the construction of houses for personal use. Any project-scale removal of gravels and are sand is not permitted. Thus, infrastructure projects are now required to import suitable aggregate, mainly from Fiji, adding considerably to the costs of construction.

127. **Unexploded ordnance**. Tuvalu was used as an important staging base for US aerial attacks in the Battle of Tarawa in Kiribati during World War II. Bomber bases on Funafuti, Nanumea and Nukufetau, being the only islands big enough to accommodate them, with the latter two being considerably closer to Tarawa. Funafuti, Nanumea and Nui were the only islands to be bombed during this operation.

128. Tuvalu was actively involved in the Allied response to the Japanese attacks in the central and south Pacific, and two of its three main atoll complexes (Funafuti and Nanumea) were bombed by the Japanese. A number of artillery battery stations were built at strategic locations in

Funafuti (one at the northern most point of Fongafale islet). There are several WWII relics, wreckage (aircraft and tender vessels) found in the lagoon as well as firearm ammunition (bullets) found buried in on the islets, recent discovery in Amatuku.

129. The development of all the infrastructure will be built along existing road easement and government leased land, apart from the acquisition of the land in north Lofeagai for the installment of the Primary treatment plant. A project specific chance find procedure will be developed to address steps to be undertaken in case UXO or a relic site is found during construction works.

B. Terrestrial Biological Resources

130. **Flora of Tuvalu.** As the soils of Tuvalu are generally of poor quality, they can support only a limited variety of flora. Thaman *et al* (212) note that the total number of vascular plants reported present at some time in Tuvalu is around 356 species, of which only 64 (18%) are possibly indigenous. The remaining 292 species (82% of flora) are exotic species that have been introduced.[24] Most of the exotic species are described as ornamental, food plants or weeds. The most common trees found on all islands are coconut (*Cocos nucifera*) stands which make up around 67% of the land cover area of the outer islands, casuarinas (*Casuarina equisetifolia*), breadfruit (*Artocarpus sp*), hibiscus (*Hibiscus sp*), papaya (*Carica papaya*) pandanus (*Pandanus tectorius*), flame tree (*Delonix regia*) salt bush (*Scaevola sericea*) and terminalia (*Terminalia sp*). These plants are widespread in the Pacific and tropical regions generally, though most are spread primarily by human cultivation. Papaya and flame tree originate from outside the Pacific region. Indigenous broad leaf species, including *Calophyllum inophyllum*, make up single trees or small stands around the coastal margin.

131. There are no endemic floral species that are unique to Tuvalu and almost all indigenous plants are widespread, easily dispersed pan-tropical, Indo-Pacific or pan-Pacific coastal species that can cope successfully in environments with loose shifting sands, soilless limestone and rock outcrops, high wave action, high salinity and sea spray, periodic flooding, strong sunlight, strong winds and drought – all of the them conditions common on the atolls and islands of Tuvalu. The low number of indigenous species is an indication of the lack of habitat diversity on atolls and low islands compared with larger high islands, the difficulty of cross-ocean dispersal of plants and the difficulty of long-term survival in the harsh atoll and low island environment.

132. From the most “natural” to the most highly modified/disturbed vegetation, the main vegetation types found on the atolls and islands of Tuvalu include:

- Inland broadleaf forest and woodland –this is represented by scattered remnant trees.
- Coastal littoral forest and scrub.
- Mangroves and wetlands.
- Coconut woodland and agroforest.
- Excavated taro gardens.
- Village household and urban gardens.
- Intensive vegetable and fruit gardens.

133. Mangrove forests, comprising two recorded species *Lumnitzera littorea* and *Rhizophora stylosa* (Rhizophoridae), also exist on muddy shores and coastal beaches where water is calm

[24] Thaman, R, Fihaki, E. and Fong T. 2012. Plants of Tuvalu. USP Press Suva.

and in areas that are protected from waves and strong currents. The mangroves of Tuvalu are listed as a threatened ecosystem.

134. **Fauna of Tuvalu**. The indigenous terrestrial vertebrate fauna of Tuvalu does not include any indigenous land mammals, amphibians or freshwater fish. There are some terrestrial reptiles, all lizards, one of which is Tuvalu's only recorded endemic vertebrate, the Tuvalu forest gecko (*Lepidodactylus tepukapili)* which was found only on Tupuka Islet, Funafuti. Pigs, fowl and dogs, all of which were imported in the 19th century, flourish on all the islands. There are also insects, land crabs and lizards, which are commonplace. The only mammal found on the islands is the Polynesian rat, which was most likely brought in with the first people. The fauna of Niutao is typical of the inhabited islands and atolls of Tuvalu.[25]

135. **Avifauna.** A total of 41 species of birds have been identified in Tuvalu, of which 28 species are indigenous. There are three main families which include Sternidae, comprising eight species of terns and noddies; *Scolopacidae*, comprising six species of tattlers, godwits, curlews and stints; *Procellariidae*, comprising five species of shearwaters and petrels. These three families account for 46% of the total number of bid species recorded. Terns and noddies are resident birds and most of them are breeding in Tuvalu. Tattlers, godwits, curlews and stints are migratory birds. Shearwaters and petrels are visitors, quite uncommon and for which no breeding sites are known.[26] There are 22 known species of butterfly and moth.

136. **Flora and fauna of Funafuti.** Funafuti has strong traditional links to some plants and birds (e.g. a special variety of the breadfruit tree that originated from Polynesia). Further, the conditions set out by the DOE for the works acknowledge the importance of endemic and vulnerable species, and species of cultural importance, such as the coconut crab, kanava tree, *vili* lizard (found in Tepuka islet) and frigate bird in Tuvalu. The development sites do not have presence of sensitive species and habitats. Rapid assessment has confirmed that the proposed sanitation facility does not have any endemic species or ecologically sensitive species of flora and fauna present however, one kanava tree is located at the sanitation facility which serves as bird nesting site and this will be kept. During the baseline survey and construction, sensitive areas, if any such as nesting sites for turtles and sea birds will be identified and disturbance to these areas will be avoided during the works. This information will be provided to the Contractor for inclusion in the CEMP.

1. Marine Environment

137. **Overview.** Tuvalu's marine environment is the main local source of animal protein, products (such as shells) for handicraft production and revenue from licensing agreements with foreign fishing nations fishing within Tuvalu's EEZ.[27] Exploitation at the local level is mainly for subsistence use, although there has been limited local commercial fishing of finfish and shellfish for local sale and limited export on Funafuti.

138. The marine environment comprises of five main ecosystems or ecological zones; these include intertidal flats, subtidal, inland lagoon areas, subtidal oceanside reefs and oceanic and open water, with mangroves included as both terrestrial and marine ecosystems. Within each of these zones are many combinations of habitat types, including algal flats, coral reefs, channels

[25] Government of Tuvalu. 2016. Tuvalu National Biodiversity Strategy and Action Plan: Fifth National Report to the Convention on Biological Diversity (Ministry of Foreign Affairs, Trade, Tourism, Environment and Labour)

[26] Job, S. 2009. Tuvalu Marine Life Project - Phase 1 Literature Review (Funafuti, Tuvalu)

[27] Government of Tuvalu. 2016. Op cit

or reef passes, soft sandy and hard substrates or bottoms and seamounts, each with their own characteristic biological communities.

139. All zones are important for fisheries with the intertidal flats being among the most important, over exploited, and increasingly vulnerable traditional fisheries. Studies of Tuvalu's finfish resources, including sharks, rays and eels, suggest that the total number of inshore fish and offshore species could be 900 or more, about 500 of which are recognized by Tuvaluan names. The marine invertebrate fauna includes an incredible but threatened diversity of bivalve, gastropod and cephalopod molluscs, crustaceans, echinoderms, corals and other marine invertebrates. Almost of these species have been overfished or in declining numbers.

140. **Habitats and Biota.** A review of existing information of key habitats and associated flora and a fauna indicated that Tuvalu's shallow marine environments, such as that found at the project sites, consist predominantly of fringing and patch reefs, with reef flats and intertidal rocky/sandy shores. Atolls and low coral islands such as Funafuti, are generally subject to constant change through continuing growth of living corals, erosion and accretion of wave action. Importantly, Tuvalu contains many IUCN Red List threatened marine species, including many corals and migratory fauna (fish, turtles, sharks and marine mammals) that reside or forage in its nearshore environments.

141. **Marine fauna.** There are 21 species of cetaceans recorded in the waters of Tuvalu, with 11 species of dolphin, one orca, three sperm whales, three beaked whales and three rorquals. Three species of marine turtles are recorded. These are the loggerhead sea turtle (*Caretta caretta*), the green turtle (*Chelonia mydas*) and the hawksbill turtle (*Eretmochelys imbricata*).

142. There are 411 species of macro-invertebrates of which the gastropods (molluscs and snails) are the most diversified group making up 62% of the species. There are 41 species of crabs, 24 species of shrimp and three species of lobsters which make up 17% of the macro-invertebrates. The holothuroid echinoderm (*Holothuria atra*) and gastropod whelks were abundant in the reef flat at all islands. Several starfish (families Echinasteridae and Oreasterisdae) were also observed on the reef crest and slope.

143. **Rare and endangered species**. The International Union for Conservation of Nature (IUCN) Red List of Threatened Species records 3,248 species from 331 families and seven phyla listed as potentially occurring within the south-west Pacific marine region. This includes eight species that are critically endangered (facing an extremely high risk of extinction in the wild) including two sharks, one turtle, two sawfish, one stingray, one coral and one type of mangrove and 43 that are endangered (facing a very high risk of extinction in the wild) including sharks, rays, wrasses, sea snakes, sawfish and the green turtle (*Chelonia mydas*). Some 290 species are also listed as vulnerable and 234 as near threatened. These include several species of sharks and rays, sea snakes, whales, marine turtles (including hawksbill, leatherback and loggerhead) and corals from the families *Acroporidae, Agariciidae, Dendrophylliidae, Euphyllidae, Faviidae, Helioporidae, Milleporidae, Mussidae, Oculinidae, Pocilloporidae, Poritidae* and *Agariciidae.*

144. A review by Job (2009)[28] did include a comprehensive breakdown of listed species for Tuvalu. Results indicated that in 2009, there were 442 marine species listed, among which 83 species were considered as threatened (4 endangered species and 79 vulnerable species). Green turtles (*Chelonia mydas*) are the most common species seen in waters and found on beaches nesting. The leatherback (*Dermochelys coriacea*) and the hawksbill (*Eretmochelys imbricata*) species are mostly seen in waters and are caught by fishermen infrequently.

[28] Job, S. 2009. Op cit.

145. The current IUCN Red List database provides summary information regarding the number of threatened and protected species by country (Table 4.2). This indicates that for Tuvalu there are a total of 1023 animal species listed including those that are endangered, vulnerable and near threatened. A large proportion of those species are lower risk/least concern and/or are data deficient. Current species-specific information is not available by country on the IUCN website.

Summary of Red List Categories for Tuvalu

Country	Tuvalu											
Category	EX	EW	**Subtotal**	CR	EN	VU	**Subtotal**	NT	LR/cd	DD	LC	**Total**
#Species	0	0	**0**	0	8	87	**95**	118	3	56	751	**1023**

IUCN Red List Categories: EX - Extinct, EW - Extinct in the Wild, CR - Critically Endangered, EN - Endangered, VU - Vulnerable, LR/cd – Lower Risk/conservation dependent, NT - Near Threatened (includes LR/nt - Lower Risk/near threatened), DD - Data Deficient, LC - Least Concern (includes LR/lc - Lower Risk, least concern).

146. There are no critically endangered species in Tuvalu. There are four endangered marine species; green turtle (*Chelonia mydas*), fin whale (*Balaenoptera physalus*), humpback whale (*Megaptera novaeangliae*) and the Maori wrasse (*Cheilinus undulates*). There are 87 species listed as vulnerable including 70 species of coral, clams (2 species), grouper (3 species), shark (3 species) and one sperm whale species. No birds or terrestrial species are considered endangered or critically endangered.

147. **Critical habitat**. The migratory green turtle (*Chelonia mydas*) is identified as endangered and lives and nests in atolls and islands in Tuvalu (within shallow bays and protected shores which include coral reefs and near-shore sea grass beds). These turtles are frequently seen in the Funafuti lagoon and have active nesting sites on other motus within the Funafuti Conservation Area. There are no active turtle nesting sites along the seaward side of the proposed Primary treatment plant nor are there any critical habitats identified along the road easements.

148. **Protected areas**. The Funafuti Conservation Area was established by formal legislation with the rest through local actions and established and managed through by the local government and the communities. Declared ‘marine reserves’ have been established to ensure sustainable harvests after recognition that many fish such as grouper, snapper, algal grazing fishes, squirrelfish, drummers and turban shells were becoming scarce. The proposed sites for the project will not impact any of the existing protected areas.

149. **Marine ecological baseline survey**. The marine ecological baseline study is proposed to be conducted during the design phase or prior to the start of construction of the infrastructures. The bio-aquatic baseline survey will be conducted along the seaward side of the primary treatment plant along the project influence area, including areas beyond the footprint or limit of physical works, along the laydown area of the outfall pipe on the reef flat to the outfall outlet along the reef slope. The baseline survey and marine ecology report will be complimented with underwater photographs and videos using an underwater ROV and from the shore on foot at low tide. Where possible, sampling will also be undertaken at reference sites to provide a broader assessment of conditions at the site and to provide a baseline for future monitoring if required. Photos and video of each site, including the types of coral, macro-algae and other biota (fish and mobile invertebrates), will be taken for subsequent identification of taxa present.

C. Socio Economic Resources

150. **Population**. The Tuvalu 2012 census[29] recorded a total population of 10,782 which included short term visitors, tourists, and temporary contract workers. Compared to the previous census in 2002 the resident population in 2012 had increased by 13.7% to 10,640. A mini census was undertaken in 2017[30] which showed that the resident population of Tuvalu between 2012 and 2017 was relatively stable but the resident population of the outer islands declined 20.8%. The South Pacific Community (SPC) recorded a total resident population of the 10,580 in 2020 (https://sdd.spc.int/tv); a small increase on 2017.

151. Sixty-four percent or some 10,500 of Tuvalu's population lives on the capital island of Funafuti. The remaining population is distributed across the other eight islands and atolls, each with one or two villages. There are no domestic aviation services from the capital, Funafuti, to the outer islands, and since around 2003, populations on the outer islands have been declining due to the lack of economic opportunity and limited social services. While Funafuti attracts most of the working-age population, the outer islands have a larger share of the population over 60 years of age. The Government of Tuvalu (GoT) is actively trying to improve infrastructure in the outer islands to incentivize the return of local populations and avoid overcrowding in Funafuti.

152. There is a general out-migration of people aged between 25-44 years from the outer islands (which have a median age of 23.3 years) with people seeking better employment, social and health opportunities in Funafuti or abroad. Funafuti, with a population of around 6320 people, makes up around 51.1% of the total population and experienced an increase in the resident population of 37% between 2002 and 2012 and 16.3% between 2012 and 2017. The average population density was 274 persons/km^2 in 2012 and 233 persons/km^2 in 2017.

Population of Tuvalu by Island

Island	Resident Population 2012			% of total population	% population change 2002-2012	Resident Population 2017	% population change 2012-2017 (Outer Is)
	Total (Outer Is)	Male	Female			Total (Outer Is)	
Nanumea	612	322	290	5.8	-28.4	534	-12.7
Nanumaga	551	297	254	5.2	-22.4	507	-8.0
Niutao	694	340	354	6.5	-15.1	622	-10.4
Nui	729	370	359	6.9	19.5	586	-19.6
Vaitupu	1542	772	770	14.5	17.7	945	-38.9
Nukufetau	666	328	338	6.3	-5.0	592	-11.1
Funafuti	5436	2796	2640	51.1	37.0	6320	+16.3
Nukulaelae	364	174	190	3.4	-7.1	315	-13.5
Nuilakita	46	25	21	0.4	22.2	19	-58.7
Other						118	

[29] Central Statistics Division - Government of Tuvalu. 2013. Tuvalu 2012: Population and Housing Census Volume 1 Analytical Report (Funafuti, Tuvalu)

[30] Central Statistics Division - Government of Tuvalu. 2018. Tuvalu Population and Housing Mini-Census 2017 (Funafuti, Tuvalu)

Total	**10640 (5204)**	**5424**	**5216**		**13.7**	**10507 (4187)**	**-1.25 (-20.8)**
% of total		**50.9**	**49.0**				

153. **Demographics of Funafuti Atoll**. There are four (4), inhabited islands of the Funafuti atoll. The main island of Fongafale and the three islets of Amatuku located to the north of Fongafale and Papaelise and Funafala located to the south. In the 2017 mini-census6 , the population of Funafuti atoll was listed as 6,320 persons (3,309 male and 3,011 female). It is the country's most populated atoll, with 63.09% of the total population of Tuvalu located there. In a recent COVID 19 household survey, undertaken in 2020, the total population was assessed to be 5,942 persons (no gender disaggregated figure is presently available) who were living in 966 households. The breakdown of populations for each inhabited island in Funafuti atoll is available from the 2017 mini-census and the 2020 COVID 19 household survey. The figures are provided in Table 6. The large proportion of the population of Funafuti atoll live on the main island of Fongafale. Here the population is divided into seven village groups, named from north to south, - Lofeagai, Teone, Fakaifou, Senala, Alapi, Vaiaku and Te Kavatoetoe. All villages are under the Funafuti Kaupule (local government).

154. The population of Tuvalu is very homogeneous, with 87% being of Tuvaluan descent and 12% being Tuvaluan/I-Kiribati or part Tuvaluan descent. Adult literacy rates are high, with 87% literate in English and 99.8% literate in Tuvaluan.

155. **Social infrastructure and services**. Pre-school education is not compulsory and caters mainly for children aged 3-5 yrs. The pre-schools are run by the government and the Kaupule. Primary School is compulsory and free for all students attending class 1 (6 years) to class 8 (13 years). There is a secondary school in Lofeagai village which caters for year 9 to year 13 education for students.

156. Being the capital, Funafuti has the main international port of entry (cargoes and shipping vessel); the only international airport; Government Building, Police Headquarters, Telecom Headquarters, PWD, TEC

157. There are two (2) health centers on the island (Te Kavatoetoe and Lofeagai) staffed by nurses and doctors. All serious medical cases are referred to Princess Margaret Hospital on Funafuti and outer island patients are transferred by ship. Obesity and diabetes are the key health issues from the outer island population and people tend to travel to Funafuti for treatment. Typically, women go to Funafuti Hospital to have their first baby three months before delivery. For subsequent births women usually remain in the outer islands. However, it is noted that many women want to travel to Funafuti for all births because they receive a government per diem (3 months) while awaiting delivery, regardless of whether they have family in Funafuti.

158. Other social infrastructure and facilities on the island include several *maneapa* (community halls),each island communities having their own maneapa, a number of Church's (EKT, Jehovah's Witness, Catholic Church, Brethren Church, Bahai Church, Mosque also Figure 4.9), and three wells. A gravel road rings the island to connect the graveyard, 800 m counterclockwise from the village, and clockwise for 400 m to the hospital. The island also has a Telecom centre, a bank and retail shops.

159. **Local economy**. The UNDP human development indicators place Tuvalu as a middle-income country with a small and highly vulnerable economy, strongly linked to external economic influences (Tuvalu uses the Australian dollar as its currency). Government revenues are primarily derived from license fees from foreign tuna fishing vessels, the '.tv' internet domain, and income

from the Tuvalu Trust Fund.[31] Direct foreign aid and project activities also constitute a major source of revenue.

160. **Livelihoods and income**. The main sources of cash income include salary (mainly from public service employ), remittances from family members working in Funafuti or overseas, rents and pensions (Table 4.4).

Table 4.4: Proportion of Households Receiving Cash Income by Source[32]

Sources/types of cash income	% of households
Wages/salary	53.9
Remittances	43.4
Land leases/rents	41.0
Investments	24.3
Handicraft sales	26.4
Small business	15.8
Elderly Support Scheme payments	17.2
Fish sales	11.0

Source: Census 2012: Population and Housing Census Volume 1 (Table 31)

161. Monthly income in Funafuti varies depending on the economic activity and employment status of individuals. Individuals engaged in traditional economic activities like fishing or subsistence farming may have lower incomes compared to those working in the tourism sector or government services. 2017 census report states that the median monthly income for employed individuals in Funafuti is about AU$190.

162. Imported food stuffs, including frozen foods, are important sources of food for the local inhabitants and relies heavily on the Government shipping service (see below). There are frequent delays and some lines of food are in very short supply or run out until the next service arrives.

163. **Economic activities**. The major economic activities in Funafuti, Tuvalu include fishing, subsistence farming, tourism, and government services. These activities provide income and employment opportunities for the local population. Additionally, Funafuti is also the administrative and commercial center of Tuvalu, hosting government offices, banks, and other professional services. The limited availability of water sources has led to challenges in agriculture and the need for importing food products, impacting the local economy. Influx of influx of migrants from outer islands has also contributed to the economic activity in Funafuti, as these migrants may seek employment or start businesses in the urban center such as retail shops or restaurants.

164. In 2019, Tuvalu's gross domestic product (GDP) was around US$47.3 million. With a small private sector and limited resources to support socio-economic development, the public sector is

[31] *The* Tuvalu Trust Fund *was established in 1987 by the* United Kingdom*,* Australia*,* New Zealand*. The Fund, an overseas-managed investment fund, has contributed roughly 11% of the annual government budget each year since 1990. The Fund had initial capital of about AU$27 million at independence and now totals about AU$120 million, with a capital value of about 2.5 times GDP, the Fund provides an important cushion for Tuvalu's volatile income sources from fishing and royalties from the sale of the '.tv" internet domain. The '.tv' domain name generates around $2.2 million each year from royalties, which is about ten per cent of the government's total revenue.*

[32] Sourced from Census 2012 report: Population and Housing Census Volume 1.

its main driver of growth. Employment is heavily reliant on the public sector with an estimated 65% of the population working in Government positions. There is little other industry available except for small-scale processing of timber (sourced locally or from New Zealand), handicrafts, and tourism, where small numbers of Tuvaluans are working. The latest unemployment statistics collected in 2016 show that Tuvalu has an unemployment rate of 8.49 percent. Around 26 percent of Tuvalu's population lives below the national poverty line, and most of the nation's limited land area is devoted to subsistence agriculture. Tuvalu's economy is highly dependent on remittances and the country is considered one of the most economically and environmentally vulnerable in the world

165. Agriculture opportunities are very limited due to poor soil fertility and are predominantly centered on the traditional taro-like root crop; pulaka, coconut, breadfruit, bananas, and pandanus all of which are important traditional food crops and are cultivated by most outer island households. Handicrafts such as brooms and mats, usually made by women, are another source of cash income.

166. **Employment and unemployment**. Employment in Funafuti, Tuvalu is primarily driven by government services, tourism, and the fishing industry. According to the sources provided, employment opportunities are available in government services, tourism, Kaupule, the private sector and the fishing industry in Funafuti, Tuvalu.

167. Out of a total of 7,144 residents aged 15 years and older, 59% (4,243) were economically active. A little more than half (57%) of the economically active population were males (2,423) and 43% were females (1,820). Differences were seen by sex between Funafuti and the outer islands in terms of economic activity. Where 60% of women were economically active on Funafuti (1,069), just 42% were economically active in the outer islands (751). More women were in the labor force on Funafuti than in the outer islands. Around a quarter of the workforce was employed within the public administration and defense sector in 2012, which includes the island Kaupule, Police force and the Government offices. and about 18% of the population in Funafuti worked in Wholesale and Retail trade and mechanical work.

Table 4.5: Main Economic Activity in Tuvalu.

Region	Economically Active								Economically Inactive					Total
	Employer	Employee	Self-employed producing goods/ services for sale	Self-employed producing goods/ services for own family use	Unpaid worker in family business	Voluntary work	Unemployed	Total economically active	Student	Home Duties	Retired	Did not work	Total economically inactive	
Tuvalu														
Total	30	2,015	133	276	62	46	1,681	4,243	527	1,985	105	284	2,901	7,144
Male	21	1,135	64	164	38	14	987	2,423	212	761	62	126	1,161	3,584
Female	9	880	69	112	24	32	694	1,820	315	1,224	43	158	1,740	3,560
Funafuti														
Total	30	1,375	105	28	31	3	842	2,414	178	854	55	123	1,210	3,624
Male	21	769	51	23	18	2	461	1,345	83	328	33	66	510	1,855
Female	9	606	54	5	13	1	381	1,069	95	526	22	57	700	1,769
Outer islands														
Total	0	640	28	248	31	43	839	1,829	349	1,131	50	161	1,691	3,520
Male	0	366	13	141	20	12	526	1,078	129	433	29	60	651	1,729
Female	0	274	15	107	11	31	313	751	220	698	21	101	1,040	1,791

Source: Tuvalu National Population & Housing Census 2012 (Table 51)

168. In 2017, the Tuvalu labor force indicators showed a significant change in the labor force participation and unemployment rate, shown in Table 4.6. The overall labor participation rate for Tuvalu had fallen, with only 40.9% of the population in Tuvalu's outer islands in the labor force, and 34.5% of those unable to find work. The unemployment rate was higher for females (30.4%) than males (27.2%) and women in Funafuti were found to be more economically active than those the outer islands.[33]

Table 4.6: Labor Force Indicators 2012 - 2017

Indicators	2012 Tuvalu (%)	2017 (%)				
		2017 Tuvalu	Male Tuvalu	Female Tuvalu	Funafuti	Outer Islands
Labor force participation rate	59.4	49.3	58.5	39.7	54.8	40.9
Employment population ratio	28.6	32.7	40.0	25.2	38.8	23.4
Unemployment rate	39.6	28.5	27.2	30.4	25.5	34.5

Source: Government of Tuvalu 2017 Mini Census

169. In 2019 the overall national labor force participation rate was recorded as 50.1%, an insignificant increase from 2017, but still significantly lower than the 2012 rate.

170. The Human Capital Index (HCI) estimates that a child born in Tuvalu today will be 45 percent as productive when she grows up as she could be if she enjoyed completed education and full health. This is a lower HCI than the average for East Asia and Pacific region (52 percent) and for Upper Middle-Income Countries (UMIC) (56 percent).

171. **Power and decision-making**. Each island has a local governance structure operationalized by the *Kaupule*, which administers and manages the local island government responsibilities. Their leadership and decision-making body is the *Falekaupule* ('Assembly of Elders'), made up of men and women who are over 50 years old. Typically, there are two parallel and equal leadership structures: the *Aliki*, a person whose role is similar to a Chief and inherits from their father's line, and an elected role of *Pulefenua* ('Island leader'*),* who leads in conjunction with, and supported by, the heads of each of the founding families.[34]

172. **Land tenure, ownership and use**. The land tenure system in Tuvalu is held in title by families and individuals, passed down through kinship ties. The foreshore area and area under the high- water mark is Government owned, or 'Crown' land. The water towers will be built on existing government leased land, whilst the piped network will run along the road easement, which is leased by the government. The location for the primary treatment facility will require land acquisition, new lease to be made between the government and the landowners. Compensation for the use of this land, and the removal of trees, will be agreed through negotiated settlements. The land due diligence report presents the details.

[33] Government of Tuvalu. 2012 Census.

[34] UN 2008. Consideration of reports submitted by State parties under article 18 of the Convention on the Elimination of All Forms of Discrimination against Women. Retrieved from: http://docstore.ohchr.org/SelfServices/FilesHandler.ashx?enc=6QkG1d%2FPPRiCAqhKb7yhsqWC9Lj7ub%2FHrJVf1GxZMHH31xXA4CdNZ3MMy0rDBt4tT1i3ISzpjHcqyXFIF%2BJVV6nCYHzWyQ3k9LQeL2A4frVKJ43jhcJj3jt%2BgjMS3hv1

173. **Energy.** Everyone on the island has electricity through connection to a mini-grid supplied by 80% solar power and 20% diesel generator. The diesel generator is used as a back-up supply when solar is low.

174. **Water supply and sanitation.** Rainwater is primarily used for human consumption, agriculture and domestic uses and supplemented by ground water during periods of drought.

175. **Sanitation** is provided through septic tanks by 90% of the population. When septic tanks are full, a hole is dug, and septic waste is dumped into the hole. This practice is recognised by the community as a potential source pollution to the ground water system and an alternative long-term solution to dealing with septic waste on the island is needed.

176. **Waste management.** Domestic solid waste is disposed of at a designated tip area on the island. At the dump site waste separation is practised with tins and plastics separated from dangerous items such as used batteries. The area is periodically managed by bulldozers and excavators when not working on construction projects. Burning of waste is prohibited on the island.

177. **Physical and cultural resources**. Funafuti does have WWII wreck sites in the lagoon and relics in Amatuku and north Fongafale. During the consultations, when asked if there were any sacred sites on the island, participants mentioned that grave sites around the island and religious sites were sacred, but it is not near the proposed development. However, a chance find procedure will be included in the contractor's CEMP in the event that any sacred sites are identified during project implementation.

178. **Sector context.** Funafuti faces many urban challenges seen in other cities, particularly inadequate water supply and sanitation services, and an increasingly high rate of communicable diseases. The groundwater is unsuitable for drinking because of saltwater intrusion and anthropogenic contamination. Rainwater harvesting is the primary source of drinking water all over the country. Despite high average annual rainfall (3,483 millimeters), Funafuti frequently experiences short dry periods. Dry periods longer than 10 days typically result in water shortages, which require desalinated water to be delivered via trucks to household and community tanks. 1 The new desalination plant, with a capacity of 180 m 3 per day and 1 The Public Works Department (PWD) delivers desalinated water to community tanks for free for collection by residents as well as households on order. Households are charged AU$27 per 500 gallons ($8.16 per cubic meter) for delivery 6 commissioned in January 2022, is operated by the Government through the Public Works Department (PWD), a division of the Ministry of Public Works, Infrastructure Development, and Water (MPWIDW). The desalination plant's capacity can now meet demand during severe droughts and the existing water storage capacity in Funafuti limits resilience to prolonged drought. Also, the capacity of the PWD to deliver water to all households in Funafuti is limited by their water tanker truck capacity of two tanker truck units of 10,000 liters each.

179. Most households rely on on-site sanitation facilities as Funafuti has no centralized sewer system. About 86% of households have flush toilets with septic tanks, 7% have pour- flush pit latrines, and 3% have composting toilets, however, most septic tanks are poorly constructed, with no desludging, and are often breached during flood events. The PWD charges AU$60.0 to empty household septic tanks. The septic trucks typically discharge untreated sewage directly offshore at the north end of Fongafale islet. Some open defecation occurs in Funafuti as several households have limited or no sanitation facilities.

180. Inadequate sanitation is a major cause of disease world-wide and improving sanitation is known to have a significant beneficial impact on people's health. Basic and safely managed sanitation services can reduce diarrheal disease and can significantly lessen the adverse health

impacts of other disorders responsible for death and disease among millions of children. Diarrhea and worm infections weaken children and make them more susceptible to malnutrition and opportunistic infections like pneumonia, measles, and malaria. The combined effects of inadequate sanitation, unsafe water supply and poor personal hygiene are responsible for many of childhood deaths. Every year, the failure to tackle these deficits results in severe welfare losses - wasted time, reduced productivity, ill health, impaired learning, environmental degradation, and lost opportunities.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Overview

181. The IEE provides an analysis of anticipated impacts associated with the construction of the water tower, primary treatment plant and the installation of the piped network. Environmental safeguard measures have been incorporated in the project as follows:

a. Pre-construction phase - updating of detailed design, undertaking of further surveys as required and preparation of documentation required under the contract - prior to any construction works. During this period the EMP is updated based on the additional information available, designers incorporate environmental measures in the project design, the updated EMP is incorporated into technical specifications and bid documents, the contract is tendered, a contract is awarded, and the contractor may mobilize but civil works (including any site clearance or preparation activities) are not permitted to start until the notice is issued. The contractor's environment, health and safety officer (EHSO), or specialist engaged to support the EHSO, will prepare the construction EMP (CEMP) during this period. The CEMP will be reviewed and cleared by the construction supervision consultant (CSC) and ADB and its environment specialist (ES) with the PMU;

b. Construction phase - the period from the time that the "notice to proceed" is issued to the contractor to when the "certificate of completion" is issued. The contractor will construct the project as per the design and technical specifications and implement the measures included in the approved CEMP. This process will be documented by the EHSO and monitored by the CSC and PMU; and

c. O&M phase - the period starting when the "certificate of completion" has been issued by MCT until the end of the 20-year lifetime of the project. The MCT will be responsible for implementing the measures identified in the operation phase of the EMP to mitigate post-construction impacts.

182. To assess the anticipated environmental impacts of each phase of the project, it is necessary to understand the sequence and elements of the proposed work leading up to and during the construction and operation phases.

B. Design and Pre-construction Impacts

183. **Access to land and seabed**. The project facilities will not result in displacement. The project facilities will be located on government owned land or land (including seabed) leased from owners following standard agreements negotiated through the Kaupule. Compensation will be paid for any assets (fences etc.) affected or requiring removal (trees and crops). A due diligence report (DDR) has been prepared. The only land that is required which will be leased is for the proposed sanitation facilities. The DDR will be updated during the detailed design and third-party verification will be completed at that time.

184. **Geotechnical investigations and detailed design**. Detail design will be undertaken during phase 2 of the project, and this will be further updated, as required, to incorporate information from the geotechnical investigation on specific sites. The updated detailed design will consider the design of towers and provide information on possible aggregate sources for concrete works. The updated designs will be reflected in an updating (as required) of the IEE and EMP, the bidding documents (through bill of quantities and employer's requirements) and the updated EMP.

185. **Updating of the EMP and bid documents.** Prior to recruitment of the CSC, an individual environmental specialist will be recruited to undertake tasks associated with updating the IEE and EMP and inputs to the tender documentation and bid evaluation. Terms of reference (ToR) have been prepared for the environmental specialists (for the individual and the ES included in the CSC) and are included in the PAM.

186. The IEE and EMP will be updated following the update of the detailed designs based on geotechnical investigations, changes/modifications to structural designs and to include any additional information or requirements in respect of dredging (or alternatively direct drilling) limited to the sea outfall, excavation and earth works and locally available construction materials.[35] The assessment will then be formatted as preliminary environmental assessment report (PEAR), checked for compliance with requirements of the Environment Protection Act 2008, and submitted for clearance to the DOE and issue of the development approval.

187. The updated IEE and EMP, along with any conditions of the development approval, will be incorporated into technical specifications and bid documents. Following contract award, the contractor, with support as required from the CSC, will prepare the CEMP responding to the EMP and providing the site-specific drawings, work method statements, sub-plans (as detailed in next sections), details and construction methodologies (including specifics around dredging method, impact mitigations and dredge spoil disposal).

188. **Adaptation for climate change**. The design and construction of Funafuti will incorporate measures to adapt to future climate change, such as accounting for the projected rise in sea levels and ensuring the structures are built at heights above the current sea level to enhance climate resilience. The infrastructure design and construction. Specifically, it will be important to factor in the projected rise in the mean sea level as indicated in Climate Risk and Vulnerability Assessment such that the relative heights of the structures above the current seal level must take this into account to ensure there is a strong element of climate resilience built into the design.

189. **Alien and invasive species introduction**. The mobilization of construction machinery/equipment and materials from the source country may result in the accidental introduction of soil-borne weeds, pests and pathogens becoming established on the island and reef environment. All construction machinery and equipment must be steam cleaned and all organic material must be removed in the source country prior to deployment with an appropriate approved phytosanitary certificate issued supported by any other documentation required under Tuvalu legislation.

C. Construction Impacts on Physical Resources

190. **Air quality**. There are no anticipated permanent impacts on air quality from the construction activities. Exhaust emissions and dust (see below) will be generated from construction machinery, pile drivers, vehicles, and mobile generators. Mitigation measures will include:

[35] Due to the limited sand, rock and other aggregates in the Tuvalu islands and atolls, it is most likely construction materials will be imported.

- Use and operation of fully maintained vehicles and diesel equipment that have been certified as compliant with local air quality legislation prior to transshipment to project site; and
- Avoiding idling of vehicles when not in use and unnecessary operation of vehicles and equipment.

191. **Dust control**. Dust may be generated by some land based activities including: (i) excavation and dumping of spoil and sand during installation of the piped network and construction of the water towers and primarily treatment facilities; (ii) movement of machinery on construction site; (iii) clean up and removal of storm debris for use as backfill behind the seawall, and (iv) activities including aggregate preparation and concrete-mixing.

Dust mitigation measures will include:

- Use of sprayers using seawater on bare sandy areas within the village and foreshore area;
- Limit soil disturbance to only areas of the project. Prior to any clearance adequate demarcate the area to be cleared.
- Limit or suspend excavation and other dust producing activities during periods of strong onshore winds when working adjacent to village buildings and houses; and
- Covering of stockpiled materials where feasible.

192. **Soil erosion and coastal protection works**. Potential environmental impacts associated with coastal protection works include: (i) the collapse of the exposed beach profile after excavation and prior to construction of the sanitation facility resulting; (ii) the loss and dispersion of excavated material placed in heaps on the beach environment; (iii) increased erosion of the foreshore from unexpected high tides; and (iv) release of hydrocarbons or other contaminants from earthmoving machinery during construction works.

193. The soils along this beach-land interface are nearly entirely loose undifferentiated sand deposits, coral fragments and storm debris and are highly erodible, even when they are not disturbed by excavation works. High tides and storm surges can result in rill and/or scour erosion around the adjoining structures or access track leading to the beach.

194. Surface water runoff from the adjoining land and road infrastructure also plays a critical role in the level of soil erosion at this sensitive transition site.

195. General measures to minimize and mitigate soil erosion at the beach-island interface include:

- Careful planning of works such that only short sections of excavated trench for installation of piped network are exposed at one time and which can be before any advancing weather system approaches the island;
- All excavated material on reef (at the outfall site) to be immediately removed to the designated spoil disposal area. No excavated material is to remain in stock piles on the beach or reef flat between tides;
- Minimize the period that excavated areas are left unprotected and storm effects;
- Ensuring that all equipment used below the highwater mark is in sound mechanical condition, and free of any leaks of any fluid;

- Investigate the other coastal protection measures such as using gabions/seawall and vegetation rehabilitation works;
- Minimize or reduce the clearing of any vegetation along the coastline. Consultation with Kaupule and relevant government stakeholders are undertaken in finalizing the locations and numbers of trees to be cleared (if any);
- Construct sediment traps where suitable to divert overland runoff into a safe disposal area;
- Consider weather conditions during earthworks.

196. Measures to minimize the environmental effects of sediment removal on water quality due to dredging (limited to the outfall site of the sanitation facility), excavation and earthwork activities include:

- The CSC will include a suitably qualified ES and the contractor will engage a suitably qualified EHSO. The contractor will engage an environmental specialist/marine ecologist to prepare a detailed method statement in the CEMP, to be approved by the CSC and its ES prior to the commencement of any works. The statement will identify the methodology and the rationale for any selected dredging system chosen and how the contractor intends to minimize the spread of suspended sediments. During works, the contractor's EHSO will need to have appropriate experience in marine ecosystems or have ready access to a suitable expert for timely advice as required;
- Hydraulic excavators shall be in sound and well maintained condition and free of any leaks of any fluid. A pre-start inspection will be carried out on all machinery prior to the commencement of works at the start of each work period and records kept for monitoring purposes;
- All plant would be only operated by certificated and experienced operators;
- All excavation operations shall comply with relevant laws of the government of Tuvalu and international conventions to which it is a signatory;
- Excavation operations will be monitored visually by the EHSO. Photographs of trench works will be taken along with details of weather conditions, wind speed and direction for each work period. Traffic control plans will be developed and implemented by the contractor.

197. **Waste and spoil management**. The management of construction waste from the civil works can have a significant environmental impact on small remote island communities. There is generally very little ability to effectively manage solid waste as can be observed with the amount of solid waste generated by these small communities and the method of disposal. While waste pits are used, there are potential problems associated with leachate entering groundwater, which is already subject to degradation in water quality in all project sites.

198. The guiding principle to be adopted will be to remove all inorganic and solid waste generated from the construction of the facilities from the island environment.

199. The contractor will provide a detailed waste and spoil management plan as part of the CEMP. Waste management measures to mitigate the impact of solid waste and sewage at the project site include:

- Store and remove all waste hydrocarbons and filters in appropriate storage containers and remove from the island at the completion of works;

- Store and remove all inorganic solid waste include steel, formwork, fittings, pipes, hydraulic hoses, tires and any other spare parts used with construction equipment;
- Install on-site toilet facilities with an appropriate self-contained sewage tank which will be approved by the Ministry of Works and must follow design requirements under the draft National Building Code; and
- Household refuse to be disposed at the local dump site.
- Compost all green and organic wastes to assist soil improvement for communal food crops or use as pig food.

200. **Storage and handling of hydrocarbons**. Hydrocarbons (fuel, lubricants and marine paints and solvents) stored, dispensed and used during construction works by vehicles and plant and equipment pose a potential hazard to the marine environment, communities as well as the subsurface fresh water lens on the island if leakage or spillage occur. Large quantities of hydrocarbons will be required for each site for the duration of the project due to the logistics and the long supply line. Extreme care is required to ensure there are no accidental spills.

201. All hydrocarbons will be stored either on the supply ship, barge or on a dedicated land based facility. The proposed storage shed has been selected in conjunction with the Kaupule to ensure it does not impact any houses or water supplies. Measures to minimize or prevent the environmental impacts of accidental spillage of hydrocarbons include:

- A spill response plan to be included in the CEMP;
- A comprehensive site induction prepared by the contractor, with input from the PMU and Kaupule will be required for all personnel involved with the project, with specific attention made to the sensitive atoll and reef environment;
- All personnel involved in the handling of dangerous goods will be trained and inducted in the handling, emergency procedures and storage requirements for different types of substances;
- Where fuel is stored on land, it will be in dedicated areas in sealed tanks placed within a concrete bund that has 110% of the capacity of the drums or storage;
- Storage areas to be located at least 50 m away from the marine environment and should be fully secured and locked when not in use;
- Material safety data sheet is to be provided for all hazardous substances;
- Smaller volumes of hazardous substances should be contained within a metal storage locker within the storage shed;
- Due to the porosity of the soil, lined pits to separate oil and water will be required near any workshop or maintenance shed to prevent leaching of hydrocarbons into the water table;
- Vehicles and machinery will be refueled by authorized and trained personnel only in designated areas to reduce the likelihood of spillage in a sensitive environment;
- Drip trays will be used during refueling or servicing to prevent spillages onto the ground or the marine environment.
- Re-fueling is not permitted over water or in the marine environment. All refueling must take place on land in a designated area;
- Development of procedures for cleaning up and reporting of accidental spills;

- Spill-kits will be made available for land and sea-based fuel facilities;
- Collection, disposal and removal of all waste oil, filters off the island; and

202. **Construction demobilization and site rehabilitation.** When the construction activity has been completed, the construction camp, if any, will be demobilized. To minimize any ongoing impacts from the establishment of laydown or construction camp areas, the contractor will provide a detailed management plan on how the site will be rehabilitated. Prior to the establishment of any camp sites, approval from relevant government authorities is obtained and landowners. This will include the removal of all construction material, used or unused, and may include re-vegetation activities.

D. Construction Impacts on Biological Resources

203. **Vegetation loss**. Removal of trees and vegetation during the construction activity will be avoided as much as possible at the sanitation facility. Only surface vegetation, limited to grass and shrubs will removed from within the construction zone whilst the coastal littoral vegetation (5m buffer zone from the berm) will be protected, so as to provide long term protection to the foreshore area. Trimming of large trees, such as the Kanava and the coconut trees will be required for cyclone preparation. These will be conducted with the assistance of the Kaupule and the Disaster Management office and new trees will be replanted around the site, along the coastal buffer zone.

204. The precise location and area to be cleared for the facilities has been confirmed by survey. Large single trees in the area designated for the drying beds and water tanks should be retained where practicable to prevent soil erosion, provide shade and amenity value. However, these individual trees should not be retained where they are exposed to the influence of winds impacting on their stability, or the root plate is damaged during site preparation or they are affected by disease as they may result in damage to the infrastructure.

205. Measures to minimize any damage to critical shoreline or other vegetation will include:

- Clearly identify and mark on the trees and a site plan, with the assistance of the Kaupule, the exact location of any area to be cleared and what trees are to be retained prior to any cutting or removal. Ensure the site plan is provided to the contractor.
- Clearly identify alternate suitable beach access sites if the current one is not appropriate for the machinery. The alternate site will be preferably the one which causes the least damage to the shoreline.
- All contractor staff, especially machine operators, will be made aware of the location and what vegetation is permitted for removal by way of a comprehensive site visit which includes the Kaupule.
- Retain mature trees for amenity value, shade and protection of the soil resource where practicable.

206. **Direct loss of habitat and sessile fauna**. This will likely occur within the footprint of the ocean outfall area. The direct loss of habitat from dredging (alternatively direct drilling) and placement of the marine infrastructure will result in the irreversible loss of intertidal flat and subtidal reef habitat.

207. Very little live coral or coral habitat, and other benthic fauna were observed on the reef flat during the site visit in May and September 2023. Given there would only be a small area of

reef crest directly affected, the overall loss of live coral and associated fauna from the project will be limited to the outfall footprint and negligible. Macro-algae is dominant on the reef flat, more macro-algae habitat would be directly affected by the project than coral habitat. However, the direct impacts to macro-algae assemblages would be inconsequential given reef flat is a very common habitat.

208. The marine environment around the proposed development site comprises of three main ecosystems or ecological zones; these include intertidal flats, subtidal Oceanside reefs and oceanic and open water. Within each of these often overlapping zones are many combinations of habitat types, including algal flats, coral reefs, channels, and soft sandy as well as hard substrates, each with their own characteristic biological communities.

209. The marine environment around the proposed development site comprises of three main ecosystems or ecological zones; these include intertidal flats, subtidal Oceanside reefs and oceanic and open water. Within each of these often overlapping zones are many combinations of habitat types, including algal flats, coral reefs, channels, and soft sandy as well as hard substrates, each with their own characteristic biological communities.

210. The intertidal region can be divided into three distinct zones (low, middle, and high), based on the overall average exposure of the zone. Organisms in the intertidal zone are adapted to an environment of harsh extremes. The low intertidal zone, which borders on the shallow subtidal zone, is only exposed to air at the lowest of low tides and is primarily marine in character. This zone shows the highest percentage of live coral cover and species diversity on the intertidal area. The mid-intertidal zone is regularly exposed and submerged by average tides, and is predominantly covered with algae and has sandy substrate. The high intertidal zone is only covered by the highest of the high tides, and spends much of its time as terrestrial habitat. Coral rubble and exposed reef platform is predominant in this zone due to coastal erosion. Table below shows the marine flora and fauna observed during the rapid assessment taken in September 2023.

Table 3: Results of Rapid Marine Biota Assessment Carried Out at Proposed Outfall Site Reef Flat

Zone	Substrate	Marine fauna/flora observed
Low-intertidal zone	Hard coral platform, with patches of live coral. The reef crest zone shows	Coral communities throughout the lagoon are overwhelmingly dominated by a number of branching *Acropora spp.* including *A. nobilis* and likely *A. florida*, with lower cover of plating *A. hyacinthus* or possible *Montipora Foliosa* and several corymbose forms of predominantly *Acropora spp.* were the most common coral species identified during the investigation. A few, isolated colonies of small *Favia spp*. and *Fungia spp.* were also observed. Low densities of grazing fish species (mostly juveniles in spurs and grooves) were observed. The most commonly observed species included the blue-lined surgeonfish (*Acanthurus lineatus*), lemonpeel angelfish (*Centropyge flavissima*), surge damselfish (*Chrysiptera brownnriggii*), and lined bristletooth (*Ctenochatus striatus*). Moray eels (*Gymnothorax pictus*). Some long-spin sea urchins were also observed burrowed in the reef flat, in between spurs, in particular - *Diadema antillarum)*.
Mid-intertidal	Majority sandy with pools filled with coral rubble and gravel.	Algal grown in this zone was predominant and along the edge of mid-intertidal and low-intertidal zone, it was seen that algae were competing with and overgrowing live coral in many places, and significantly occupying the spaces between the crevices, gorges made on the reef platform, as well as below branching live coral colonies. The most

		common algae species included: *Asparagopsis taxiformis, Caulerpa sertularoides,* and patches of *Enteromorpha spp, Halimeda cf gracilis,* and a few patches of brown-algae, *Padina sanctae-crucis.* Echinoderms and Holothurians were most abundant in this zone. Long-spine sea urchin, *Diadema antillarum* were also observed during the survey borrowed in the reef platform crevices, two species of Holothurians were also observed, *Holothuria atra* and *Bohadschia marmorata.*
High-intertidal	Particularly cemented reef flat area. Rocks and pebbles, exposed on the reef flat. Most of the rocks observed in this zone has been broken and washed out from the seawall	This zone is completely exposed during low tide and has the least diversity. Epifauna observed in the area consists of include hermit crabs *(Coenobita spp.)*, common shore crabs (likely *Cyclograpsus granulosus*) in crevices between rocks laid along the seawall and sea snails were also observed feeding in the intertidal zone – these includes periwinkles (*Echinolittorina spp.*) and frilled dogwinkle (likely *Nucella lamellose*).

211. **Impacts on marine fauna from construction noise**. Underwater noise generated from construction activities could deter fauna away from the vicinity of the construction site. These impacts will be limited to the ocean outfall site and will be very limited. Excavation works using the methods described are considered unlikely to generate noise of an intensity or duration that may result in physiological impacts on species, but would likely temporarily alter behavior, i.e. animals would move away from the construction area. These impacts would also be intermittent and short term (approximately two months) and localized. However, management measures could be applied to further reduce underwater noise impacts to protected marine species.

212. The EMP should include procedures to limit physiological impact to marine megafauna due to sound and vibrations generated during dredging (alternative direct drilling) limited to the ocean outfall site, excavation, earthworks and construction activities. The construction Contractor should ensure that all equipment is maintained in good operating condition and has proper sound control systems in place. The contractor is to apply sound mitigation, where appropriate and practical. This should include:

- Ensuring that all equipment is maintained in good operating condition and has proper sound control systems in place;
- Application of sound minimization tools, where appropriate and practical. This may include for example mufflers, propeller shrouds; and tuned propellers and drive shafts; and
- Sound-generating equipment should be switched off when not in use.

213. **Impacts on marine and terrestrial fauna from lighting**. Construction works using the methods described are considered unlikely to generate light of an intensity or duration that may result in physiological impacts on species, but could temporarily alter behavior. Any night construction activities would generate light which could deter or attract fauna away from the vicinity of the construction site. Contractor will ensure that they obtain approvals from relevant agencies for night works, if required.

214. These impacts would also be intermittent, short term and localized. However, management measures could be applied to further reduce lighting impacts to protect marine and terrestrial species sensitive to it. Although it is understood that works would be done during daylight hours, any lighting used during the period of construction would need to be shielded and all effort should be made to minimize light emanating from the construction site.

215. **Ciguatera**. Ciguatera is a foodborne illness caused by eating certain reef fish whose flesh is contaminated with a toxin made by dinoflagellates such as *Gambierdiscus toxicus*. These dinoflagellates adhere to coral, algae and seaweed, where they are eaten by herbivorous fish which in turn are eaten by larger carnivorous fish. It is therefore possible that disturbance through dredging and outfall has potential to increase the risk of Ciguatera via the disturbance of these dinoflagellates, particularly in the outfall site, where it is previously known to have been an issue.

216. It is recommended that although the risk of a Ciguatera outbreak is considered low, the following mitigation measures should be in place:

- It is recommended that a risk assessment be undertaken to determine whether there is a need to incorporate testing for harmful dinoflagellates in fish tissues into the EMP for implementation during the construction works. This should be carried out in consultation with PMU and TFD.;
- Minimize the disturbance of the reef surface in any marine infrastructure project and remove any sediments from the reef surface to reduce the likelihood of an algal bloom occurring on the fresh reef material
- A register should be established to document any cases of Ciguatera brought to the attention of medical staff for a period six months before, during, or 6 months after construction;
- Any cases should be reported to the Project Manager and the FWSSP so that appropriate safeguards can be put in place. This could include (for example) a notice to advise against consumption of herbivorous reef fish on the islet until further testing has occurred and/or sufficient time has passed post-construction and such fish are considered safe to eat; and

217. **Introduction of alien species or pests**. Vessels and movement of offshore equipment have potential to act as vectors for introduced species. Introduced species (such as the crown of thorns starfish (*Acanthaster plancii*)), have potential to be translocated into the project marine area via work boats through the release of ballast water (in the case of planktonic larvae or species) or via reproduction from individuals attached to the hull of a vessel.

218. Marine pests are a long-term, but reversible impact to which marine communities would have an existing level of exposure.

219. As there will not be sufficient suitable aggregate available locally, it is proposed that all concrete elements for the sanitation facility and elevated reservoirs will imported (likely from Fiji). Some aggregate and construction material and vehicles may be trans-shipped to the project sites and used for the construction of infrastructure and other ancillary works associated with the project. There is a small chance that weed seeds may be present in this material and it will be important to ensure the likelihood of this is minimized with attention by the supplier to hygiene requirements for imported material. The contractor should provide fumigation and phytosanitary certificates to PMU for all imported construction materials.

220. Mobilization of equipment by sea (on barges) and hygiene requirements (such as phystosanitary and biosecurity certifications) will be a key consideration to ensure no alien weed species or other organic matter is inadvertently transported to the country. The following requirements would be in place:

- All machinery and equipment be steam cleaned to remove any soil or organic matter and a phytosanitary certificate issued by the authorities in the country of origin prior to shipment to the project site;

- Appropriate phytosanitary documentation must be issued for all imported aggregate shipments into Tuvalu to confirm they are clean of organic material and soil and pests;
- Standard practice procedures for ballast water management should be observed by vessel operators and individual vessels should be assessed to determine that the vessel presents a low risk of introducing marine pests to the area;
- Ballast waters must be discharged no closer than 5km from the shoreline with confirmation provided by the captain by way of log book details; and
- All materials and equipment to be imported for the project must be cleared, and the contractor must have obtained the appropriate license or certificate for imported material and/or equipment.

221. **Impacts to threatened and protected species and habitats**. There are over 3,000 species of threatened corals on the IUCN red list for the South West Pacific Marine Region, hence, there is potential for some corals in the project site to be on the IUCN Red List as some of the genera observed in the baseline ecological survey were for species on the list. Of all the species of fish identified, none are recorded as critically endangered, endangered or vulnerable.

222. Provided the mitigation measures outlined in the previous sections are incorporated into the EMP and appropriately implemented, these potential impacts are likely to be suitably managed. As a further precaution, it is advised that construction works take place outside of the time of known turtle nesting seasons/period.

E. Construction Impacts on Socio-economic Resources

223. **Noise and vibration**. Noise will be generated from construction machinery and particularly from the trenching works. Noise will also come from the pile driver in the construction of the tower facility at all project sites. Noise from construction machinery is generally between 80 ~ 110 decibels (dB). On-shore winds will carry noise to the village area and may become a nuisance.

224. Given these works will be carried out during the daylight hours, the noise levels are expected to be intermittent and of relatively short duration. Noise will be an issue during times of church services, important village ceremonies and close to sensitive receptors such as houses, schools and health clinics. Noise mitigation measures include:

- Use modern and well-maintained equipment;
- Operate pile drivers and hydraulic rock picks during daylight hours only and between times morning and evening as agreed with the Kaupule and PMU;
- No noisy activities to be undertaken on Sundays or other days as nominated by the Kaupule; and
- Liaise with Kaupule and PMU to minimize disruption to church services, schools and health clinics and any other sensitive receivers.

225. **Site decommissioning and rehabilitation**. When the construction activity has been completed, each construction camp, if any will be demobilized to the satisfaction of landowners. This will include any reasonable requests to use such areas for community purposes and will be done in conjunction with the Kaupule. All efforts will be made to engage local labor to undertake the decommissioning works, and where practicable, the use of women's or community groups.

226. **Use of water**. Potable and fresh water is a scarce commodity on any islands. Construction activities may impact on the supply of groundwater which is known to be increasing in salinity. There will be insufficient water within the villages to rely on any stored water for construction related activities. Any construction camp will need to be self-reliant on water from either rainfall collected in tanks or supplied from contractors portable desalination plant.

227. Mitigation measures to ensure the project does not impact on the island water supply include: (i) the contractor to be self-sufficient in the supply and storage of all fresh and potable water to be used in the construction camp and for mixing of concrete; and (ii) use only seawater for dust suppression if/as required.

228. **Cultural and Heritage management.** The main impacts for eligible activities would be minor impacts resulting from construction works, and change in natural resource use. Construction may have minor, short-term direct impacts on vegetation and local species-mainly due to soil excavation, dust and noise. All impacts will be managed through the application of an activity-specific environmental and social management plan (ESMP) and may include, for instance, measures such as proper siting of infrastructure to avoid and minimize impacts, construction contract procedures for dealing with chance finds, dust control measures, and waste management.

229. **Chance Find Procedure.** There is a possibility that project activities may result in damage to physical cultural property unless these are identified early in the process. Activities that may occur in areas with possible physical cultural resources will specify procedures for identifying physical cultural property and for avoiding impacts on these, including:

- Consultations with the appropriate authorities together with PMU and local residents and communities to identify known or possible sites during the design of project activities;
- Siting of proposed activities to avoid identified sites (including identifying such areas in protected and natural resource management planning and zonation);
- Chance finds procedures will include cessation of work until the significance of a “find” has been determined by the appropriate authorities and local inhabitants, and until fitting treatment of the site has been determined and carried out;
- Construction contract procedures will include the same procedures for dealing with chance finds;
- Buffer zones and completely fence off the discovery site or other management arrangements to avoid damage to cultural resources, such as sacred forests and graveyards. Local communities to which these areas belong should decide access procedures and should not be excluded from accessing these areas.

230. **Influx of labor - impacts of foreigners and non-local workers**. Construction activities will occur in a remote location and the consequences of the hazards and risks to construction workers and the community are high. Relatively minor injuries may result in life threatening consequences due to the difficulty in getting access to appropriate and timely medical treatment. It will be necessary to include a health and safety plan as part of the CEMP to be approved by the CSC prior to mobilization. This plan should also include details of the location and response times to emergency hospital services and an emergency medevac plan with lines of responsibility for action.

231. A construction project can have a social impact on a remote island community and there may be some community concerns in respect of the construction program. As a priority, a set of protocols (code of conduct) will be established and agreed upon with the Kaupule to determine the social and cultural parameters for working on the island. These protocols will form part of the contractual obligations of the civil works contractor. Measures to mitigate these concerns will be

addressed in discussions with Kaupule and full public consultation prior to any mobilization to ensure all construction personnel are aware of locations and the importance of the sensitive areas both within the reef environment and on land and to avoid disturbing them. All workers will be required to sign off on the code of conduct before they could be engaged in work under the project.

232. A communication and consultation plan (CCP) will be prepared by the CSC and will be implemented for all phases of the project. A grievance redress mechanism (GRM) will be established to deal with any community or individual concerns related to the project. It will be expected that there will be full and free access to the CSC to raise any issues of environmental concern due to the construction works. All efforts will be made to address any community or individual concerns in a timely and transparent manner and without retribution to the affected person to minimize any impacts that may affect project implementation.

233. The community will be advised of the GRM through a public awareness campaign and by way of the Kaupule. The process of lodging a concern or complaint and contact details of the contractor and CSC will be identified on a public notice board.

234. The presence of construction workers in small island communities can increase the risk of communicable diseases included sexually transmitted infections (STI). Communicable diseases including STI are present in Tuvalu, with higher prevalence of Chlamydia, Syphilis and Hepatitis B in the most recently available studies. There have been 11 people diagnosed with HIV since 1995, a high rate for the low population.[36] Education and training in STI and HIV/AIDS awareness and prevention is an important health risk mitigation factor for the community members and projects workers, both expatriate and those from elsewhere in Tuvalu. There are qualified agencies in Funafuti and the Pacific that can provide HIV/AIDS and STI awareness and prevention training to both the construction workers as well as the general community. The requirement to fulfil this training will form part of the tender document.

235. The following measures will be included in the CEMP to manage or mitigate potential conflict or social impacts arising from influx of workers:

- Implementation of the project's CCP;
- Ensure that community and stakeholders are aware of the GRM and how to access the GRM;
- A Labor Influx Management plan will be included as part of the contractor's CEMP.
- Appointing a grievance focal point (which will be PMU);
- CSC and PMU to facilitate agreement of protocols--code of social conduct-- between the contractor and community leaders. The protocols will govern workers' conduct while at work and in communities, behavior around women and children, restrictions on alcohol consumption, prohibitions (with sanctions for non-compliance) on workers hunting or fishing, implementation of awareness programs, implementation of the GRM and handling of complaints, hiring of local labor, and implementation of the HSP;
- The contractor will engage/recruit an approved service provider to deliver the HIV/AIDS/STI awareness and prevention program to workers and community;

[36] Ministry of Health. 2015. Global AIDS Progress Report. The first HIV case in Tuvalu was found in 1995. The cumulative number of HIV cases to 2015 is 11, two of whom have died. Of the nine people with HIV still alive, none are currently enrolled in anti-retroviral therapy.

- Workers' access to portable toilets and associated sanitation facilities will be provided at the site (either through agreement to use on-land toilets or sufficient ablution facilities on the barge).
- Following the CCP, the contractor will distribute information (through meetings or pamphlets) regarding the scope and schedule of construction, as well as certain construction activities causing disturbance or nuisance;
- For unskilled activities and labor, every effort to hire local people (including women) for these positions should be a priority;
- Child and/or trafficked labor will be strictly prohibited for any activities associated with the project;
- Accidental damage to utilities will be minimized by (i) obtaining plans from the public utilities identifying locations of pipelines, conduits and power cables and (ii) consultation with staff on the location of utilities prior to commencing excavation operations;
- Availability of screening for all workers on a voluntary and confidential basis;
- An HIV/AIDS and STI awareness and prevention campaign for all workers to be included in the bill of quantities of the contractor and delivered by a service provider approved by the government (Ministry of Health);
- Ongoing training and workshops presented to the community at regular intervals; and
- Availability of condoms, at no cost, to all on-site staff.

236. **Health and safety - workers**. Health and safety risks of construction works in a remote are high for both construction workers and the small island community. Medical assistance may be unavailable for extended periods particularly during bad weather. Therefore, all construction personnel must have a comprehensive first aid certificate prior to mobilization with at least one member being competent in advanced emergency first aid to deal with potential injuries and more serious accidents.

237. Risk can be limited by having a clear health and safety policy and an emergency response plan for all personnel and the adjacent community. To minimize health and safety risks, the contractor will provide the CSC and PMU with a comprehensive health and safety plan (HSP) as part of the CEMP which will:

- Prepare and implement the HSP which will include the measures to demonstrate compliance with the World Bank Group's Environmental Health and Safety Guidelines (EHSG);
- Define responsibilities and authorities within the contractor's staff for adhering to occupational health and safety (OHS) requirements;
- Provide personal protection equipment (PPE) for all full-time staff and part time workers;
- Define appropriate emergency and medical evacuation procedures;
- Undertake daily hazard identification checklists, risk assessments and toolbox sessions;

- Prepare appropriate work method statements for each construction activity and ensure all personnel understand the task before commencing work for the day;
- Clearly define procedures for handling construction materials, conducting tests, operating heavy equipment in a remote marine environment;
- Provide for installation of lights and cautionary signs in hazardous areas;
- Ensure operators of vehicles and equipment are properly licensed and trained;
- Provide information on emergency assistance procedures on community notice boards and location of first aid kits and other emergency equipment;
- Ensure safety and inspection procedures, setting schedules for regular checking; and
- Set procedures for safe handling of toxic materials and other hazardous substances.

238. There will also be a program to provide general health and safety awareness for construction workers prior to their arrival on site and at any time there are new employees. The program will provide the information from the HSP in the CEMP and will include: (i) introduction to OHS issues in construction sites; (ii) education on basic hygiene practices and procedures to minimize spread of tropical or contagious diseases; (iii) HIV/AIDS and STI awareness, including information on methods of transmission and protection measures; (iv) prohibition of drugs and alcohol on construction sites; and (v) availability of medical assistance for emergency or non-emergency situations.

239. **Health and safety - community**. The construction activities will create health and safety impacts on the adjacent community related to noise, dust, traffic and other risks and impacts such as communicable diseases associated with the influx of temporary construction labor. Mitigation measures include:

- The contractor's HSP will address community impacts and management measures in addition to worker health and safety. The HSP will be appropriate to the nature and scope of activities, meet the requirements of good engineering practice and national law and regulations and comply with the EHSG;
- The HSP will include agreement on consultation requirements, establishment and monitoring of acceptable practices to protect community safety, links to the complaints management system for duration of the works (in accordance with the GRM) and system for reporting of accidents and incidents. The PMU will ensure these actions are enforced;
- The contractor will coordinate directly with the GFP appointed from the Kaupule for the project;
- Before construction commences the contractor/s will conduct training for all workers on environmental safety, environmental hygiene including delivery of the HIV/AIDS/STIs awareness and prevention training and the code of conduct (see sub-section below);
- The contractor, following the requirements of the project's CCP, will inform the community of the works (likely impacts and control and mitigation measures), including the timeframe through information brochures and/or community meetings;

- Tuvalu minimum wage requirements to be observed, if local staff are required for the assessments. There should be proper enforcement of the labor laws at the work place;
- Child and/or trafficked labor will be strictly prohibited for any activities associated with the project;
- Children will be prohibited from entering the sites (including worker's accommodation, works area/construction zone) and prohibited from playing on any equipment or machinery;
- All advisory and warning signage will be clear, secured on fences, gates and signboards and be posted in Tuvaluan, the language of the main nationality of workers and repeated in English; and
- The contractor will clearly fence off and post warning signs at the site to prevent the public from entering during the construction period.

V. ENVIRONMENTAL MANAGEMENT PLAN

A. Risks Mitigations and Implementation Measures

Environmental Issue and Objective:	Mitigation Measures	Locations	Estimated Mitigation Costs	Implementation	Supervision
	CONSTRUCTION PHASE				
Protection from biodiversity loss	• Infrastructure located on existing or degraded urban land	Fongafale Is.	Nil	NA	NA
To minimize land clearance	• Land clearance to be minimized through planning of ocean outfall pipe to avoid clearance, particularly of mangrove areas. • Any areas cleared to be replanted with similar local species. • Declaration of reserve, or other government mechanism to prevent further degradation through urbanization.	Fongafale Is. Fongafale Is.	Minimal (part of detailed design) Approximately A$200 NIL	PMU / PIAC Contractor GoT	ESU ESU NISC
Protection of reef ecology (RO plant outlet – brine water)	• Ensure that the brine water coming from the RO/desalination plant is diluted and pump out to the ocean	North Loefagai	NIL (in detailed design and contractor costs)	PIAC/PMU Contractor for Construction	ESU
Protection of marine ecology	• Ensure outfalls are designed and constructed to minimize potential for sedimentation and gross pollutants from effluent discharge.	North Loefagai	NIL (in detailed design and contractor costs)	PIAC / PMU Contractor for Construction	ESU
Potential pollution from poor waste management during construction	• Any material produced by excavations will be used as backfill or sold/distributed for reuse. • Bins to be provided at all construction work sites, with waste recycled where	All work sites.	NIL	Contractor	ESU

Environmental Issue and Objective:	Mitigation Measures	Locations	Estimated Mitigation Costs	Implementation	Supervision
To dispose of all construction waste with no environmental impact	possible, and household wastes will be disposed offshore as the waste department does not have facilities to dispose of these.				
Noise emissions *To ensure no nuisance is caused to adjoining land users or general public through noise.*	• Construction operations only take place during daytime hours (7am to 6pm). • Use well maintained equipment (with mufflers where appropriate) • Provide workers operating or working in the vicinity of noisy equipment with approved hearing protection. • Inform residents in the vicinity of the project site(s) prior to any construction activities being undertaken.	All construction areas	No cost (part of civil works contract)	Contractor	ESU
Air quality and dust control *To ensure there is no health risk or inconvenience due to dust production.*	• Dust emissions will be minimal given the nature of the works. • However, if there are dust emissions, the contractor will be required to ensure this is minimized through standard site management procedures such as dust watering, or stockpile covers • Speed limits will be observed by all trucks under the project.	All construction areas	No cost (part of civil works contract)	Contractor	ESU
Safety hazards to workers and the general public. *To protect workers and the general public from risk of injury*	• Health and Safety Plan to be prepared by contractor and approved by PMU prior to work commencing. • Allocation of responsibility and training of workers in safety precautions and procedures; ensuring all staff can respond appropriately in an emergency.	All construction areas	No cost (already part of standard construction practices and contractor requirements).	Contractor	ESU

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Environmental Issue and Objective:	Mitigation Measures	Locations	Estimated Mitigation Costs	Implementation	Supervision
during construction works	• Provision of protective clothing and equipment to workers as appropriate. • Ensure vehicle and equipment operators are properly licensed and trained. • First aid facilities provided on each work site • Provision of temporary fencing around potential hazards such as excavation trenches to ensure there is no hazard to general public. • Maintenance of records of all workplace injuries and incident reports.				
Disruptions to traffic, impacting schools and workplaces	• Contractor to prepare and submit to PMU a traffic management plan. • Disruptions to be kept to a minimum, with only part of the road blocked, as required, at a time. • Contractor to provide daily community bulletins of road disruptions. • Work on major roads to not occur during peak traffic times of school drop off and pick-up and closing of offices. • Safety marking and traffic safety wardens to be utilized to reduce risk and keep the area safe for daytime and nighttime hours.	All construction areas, but, particularly, major roads.	No cost (already part of standard construction practices and contractor requirements).	Contractor	PMU, PIAC and ESU
Loss of heritage values or cultural resources	• Consultation and field work has confirmed no presence of historical or cultural resources.	All construction areas	Project Cost	Contractor	PMU/ESU

Environmental Issue and Objective:	Mitigation Measures	Locations	Estimated Mitigation Costs	Implementation	Supervision
Unexpected discovery of cultural artefacts	• In the event that any cultural artefacts or heritage elements are discovered a chance find procedure will be put in place to identify key steps to be undertaken. The PMU in consultation with appropriate community leaders and authorities will determine the course of action. Works will not recommence until directed by the PMU.				
Release of hazardous materials into the environment (e.g., fuel spillage)	• Preferably vehicles will be re-fuelled off site. Any re-fuelling that needs to take place on site must be undertaken with care to prevent spillage. • Fuels, oil, and any hazardous materials to be stored at work site only in consultation with supervising engineer (PMU/PIAC). Appropriate transport, storage and spill response must be agreed to prior to any hazardous material arriving on site.	All construction areas	Contractor risk management in budget	Contractor	ESU
OPERATIONAL PHASE					
Pollution of the marine environment *To minimize sedimentation* *To minimize gross pollutants such as plastics entering the marine environment*	• Regular maintenance of complete drainage system, including cleaning of any sediment and gross pollutant traps	Ocean outfall at North Lofeagai	Minor additional cost to existing budget allocation in PWD	LTD	Initially ESU, then handover to DoE

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Environmental Issue and Objective:	Mitigation Measures	Locations	Estimated Mitigation Costs	Implementation	Supervision
Pollution of the marine environment *To minimize sedimentation* *To minimize gross pollutants such as plastics entering the marine environment*	• Regular maintenance of complete drainage system, including cleaning of any sediment and gross pollutant traps	All outfalls into lagoon	Minor additional cost to existing budget allocation in PWDI	LTD	Initially ESU, then handover to DoE
Foul smell from sanitation facility	• There is potential of foul smell during operations of the sanitation facility. The location of the facility has been chosen to maximize the distance with the nearest residents.	North Loefagai (sanitation facility)	No cost	WSD/PWD	ESU
Noise levels	• Potential of generation of higher noise levels during operations. Operations to follow standard safe noise level standards (OHSA levels)	Funafuti (PWD/Sanitation facility)	No cost	WSD/PWD	ESU

B. Monitoring and Reporting

240. The EMP monitoring process is important to ensure safeguards are implemented and any unexpected impacts are responded to swiftly and appropriately. The monitoring process has been developed as a simple audit tool to ensure the ESU within the PMU can undertake auditing without requirement for specialized input. Table 3 provides an overview of targets and indicators to be measured in order to safeguard environmental standards throughout the project. The contractor, as per the requirements of the Contractor's CEMP, provides a first level monitoring mechanism. Additional regular monitoring by the ESU verifies that environmental mitigation measures are in place, and effective. This ESU process will utilize a specific checklist for regular audits.

Table 4: Environmental Monitoring and Reporting

Environmental Target	Means of verification	Duration/Frequency	Responsibility for Verification
Construction activities to have minimal impacts on surrounding amenity	Visual field checks. Mid and post-construction audit reports	Continuous during construction works. Audit pre, during and post construction.	Contractor ESU

Environmental Target	Means of verification	Duration/Frequency	Responsibility for Verification
Minimize waste produced on site, and ensure all waste is handled and disposed of appropriately.	Visual field checks. Mid and post-construction audit reports	Continuous during construction works. Audit pre, during and post construction.	Contractor ESU
Minimal nuisance is caused to adjoining land users or general public through noise or traffic disruptions.	Construction field checks. Verbal or formal complaints through GRM or otherwise	Continuous during construction works.	Contractor ESU
No health risk or inconvenience caused due to dust production.	Visual field checks. Verbal or formal complaints through GRM or otherwise	Continuous during construction works.	Contractor ESU
Protect workers and general public from risk of injury during construction works	Number of recorded workplace accidents or incidents. Verbal or formal complaints through GRM or otherwise	Continuous during construction works.	Contractor ESU
Illegal dumping practices minimized through clean up works, public liaison, and enforcement activities.	Visual field inspections and formal audits	Continuous Audit pre, during and post construction.	ESU
Minimize sedimentation of receiving waters in the ocean and Lagoon environments.	Water testing for suspended solids, turbidity and DO. Pre-construction, during construction and on a quarterly basis during operations	Water testing pre, during and post construction (quarterly).	ESU in collaboration with DoE

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VI. CONCLUSION AND RECOMMENDATIONS

241. This IEE has identified, as far as practical, the potential environmental impacts (adverse and beneficial) associated with the design, installation/delivery, and operation of the ship replacement project. It has also identified measures to enhance the beneficial effects and to mitigate or minimize adverse impacts. These are summarized in the EMP.

242. Overall, the impacts associated with the project are predominantly beneficial and include climate change mitigation and adaptation, improved environmental protection practices, and capacity building in the implementation phase. In the operational phase, crucially, household water supply and hygiene will be more reliable, more efficient and safer, providing better connections to health care, education and for families. Vulnerable groups such as the poor, women and children, persons with disabilities, people requiring medical attention, the elderly, stand to benefit the most from the project.

243. No impacts will arise regarding access to land ownership. Land acquired for the construction of the Primary Sewage treatment plant will be leased by the government of Tuvalu for the project.

244. The environmental impacts associated with the proposed project components have been assessed and discussed in this report. Further marine assessment by the PRF consultant will be conducted as part of PPP2 at the sanitation facility and information will be updated. The primary findings establish that the project activities can achieve protection of environmental values and will not have any significant negative social or cultural impacts. The project will not cause any significant or lasting environmental impacts. Minor impacts will be monitored and mitigated through the implementation of site specific EMPs, with monitoring and oversight undertaken by the ESU. The adverse impacts predicted to arise due to the works are limited and reversible. For example, provided the requirements of the National Invasive Species Strategy and Plan are met, a negligible residual impact relating to the introduction of alien and invasive species will arise. With measures in place to minimize any adverse effects on marine water quality and workers health and safety, the significance of such effects will be minor and short-term. Waste and spoil generation will have a negligible residual impact and no impacts on physical resources or marine ecology are predicted. Potential impacts can be managed and reduced to acceptable levels through the implementation of the measures identified in the EMP, and effective monitoring of the same by the CSC (in support of the PMU). The implementation of the CEMP and delivery of the capacity building program will be monitored and reported.

245. Strengthening the capacity of PWD/WSD to manage a complex water supply piped network serving the urban area will be fundamental as a building block for sustainable development. Tuvalu can become a leader in resilience through effective long term planning and adaption. Inclusive decision making will be integral to winning community support and ensuring that development can move from an ad-hoc individual basis to a model that supports all the community in building a sustainable future.

246. It is concluded that the Project has no further environmental issues to follow up, except for marine assessments at the sanitation facility and the adequate measures listed in IEE and EMP, when implemented, will fully comply with ADB's SPS 2009 and DOE's, Government of Tuvalu's requirements.

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TUV EIA Requirements and Checklists

	DEPARTMENT OF ENVIRONMENT **Introduction** **EIA Amendment Regulations 2017**	**Office Use Only** DAA _ _ _ / _ _ Date Received _ _ / _ _ / _ _ Amount Paid $

Send or deliver applications to the Department of Environment, Ministry of Foreign Affairs, Trade, Tourism, Environment & Labor, Government of Tuvalu, Private Mail Bag, Funafuti, TUVALU. For enquiries phone: (688) 20179 or email: env@gov.tv or buchtersn@gmail.com

Introduction and EIA Background

The DOE to ensure all development occurring Tuvalu undergo an EIA. EIA is a decision-making tool to avoid environmental damage and keep Tuvalu healthy and a way to ensure important factors can be included in decision making.

The EIA process need not be a complicated process in Tuvalu, but the following factors are important to ensure for all development:

- Confirm good engineering.
- Ensure consultation completed appropriately and project is accepted by whole community.
- Check ownership.
- Impose conditions/EMP that can guide the construction.

When the DOE is notified of a potential development, the following steps should be taken:

☐ If applicant submits a Preliminary Application form [Form 2], DOE Review proposal [Form 3] and concept drawings, liaise with developer on likely environmental considerations.

☐ When applicant submits a Notification and Application for Development Approval form [Form 4], briefly scan Application and check all information is provided (i.e., drawings, maps, information on all project phases). Consider Exemptions.

☐ Send information and drawings of proposed project to relevant departments (Kaupule, R2R, lands, Agriculture, PWD) for their comments using the memo template [Form 5]

☐ Complete Screening Assessment [Form 6]to determine what level of EIA required – No EIA, Preliminary EIA, Full EIA

Preliminary EIA, Full EIA:

☐ Complete Scoping [Form 7] and send TOR back to applicant based on findings from Screening Assessment

☐ Send consultation policy to applicant and assist to ensure community engaged [Form 8]

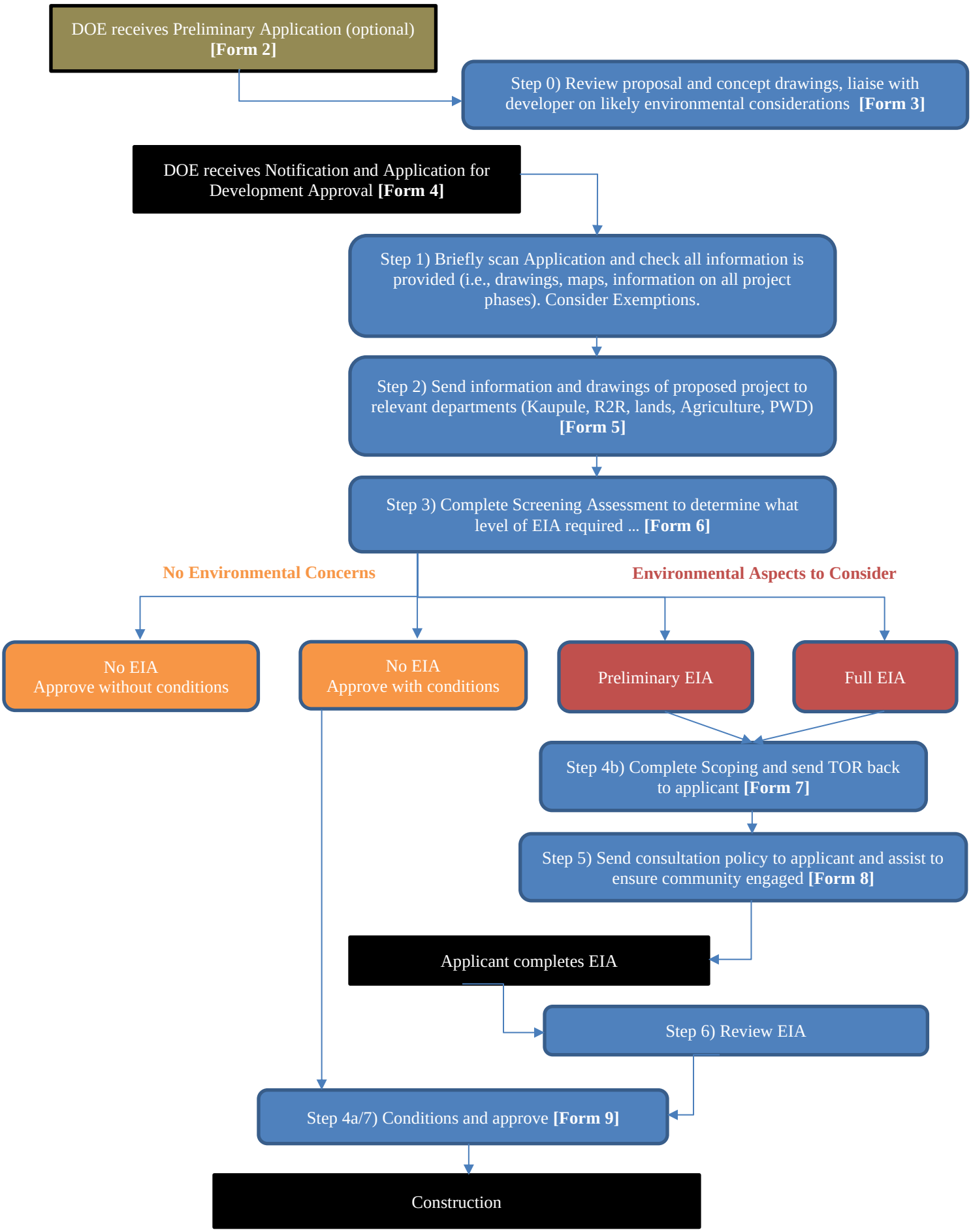
☐ Once applicant submits EIA, review and provide comments (Review EMP in particular) – send to SPREP or other agency if more advice needed.

☐ If more information/studies needed, request from developer.

☐ If DOE approve development, develop conditions (mainly based on EMP) [Form 9]

☐ Monitor development against EMP and conditions [Form 10]

SCHEMATIC OF TUVALU EIA PROCESS


DOE receives Preliminary Application (optional) [Form 2]
Step 0) Review proposal and concept drawings, liaise with developer on likely environmental considerations [Form 3]
DOE receives Notification and Application for Development Approval [Form 4]
Step 1) Briefly scan Application and check all information is provided (i.e., drawings, maps, information on all project phases). Consider Exemptions.
Step 2) Send information and drawings of proposed project to relevant departments (Kaupule, R2R, lands, Agriculture, PWD) [Form 5]
Step 3) Complete Screening Assessment to determine what level of EIA required ... [Form 6]
No Environmental Concerns
Environmental Aspects to Consider
No EIA
Approve without conditions
No EIA
Approve with conditions
Preliminary EIA
Full EIA
Step 4b) Complete Scoping and send TOR back to applicant [Form 7]
Step 5) Send consultation policy to applicant and assist to ensure community engaged [Form 8]
Applicant completes EIA
Step 6) Review EIA
Step 4a/7) Conditions and approve [Form 9]
Construction

Preliminary Development Application – to be completed by developer (Optional)

All persons proposing to undertake any development activity must notify the Department of Environment of the proposed activity. This notification can occur at any stage once the project has a concept design and location.

The sooner this notification can occur the sooner the department can advise on environmental factors to consider for the development.

This form should not be used in place of the Notification & Application for Development (DOE Form 4).

1. Applicant Details and Project Overview:

1.1 Name of proposed development:

1.2 Brief overview of proposed development (provide concept drawings if available):

1.3 Location and extent of proposed activity (provide map/sketch):

1.4 Who is the owner of the land?

1.5 Is the owner aware of the proposal?

Yes ☐ No ☐

1.6 Will project require in-water work/dredging?

Yes ☐ No ☐

1.7 Will project require clearing of mature trees and other vegetation?

Yes ☐ No ☐

1.8 Proposed construction start date:

1.9 Applicant contacts:

Name:	Position:
Ministry/Company:	Telephone:
Address:	Email:
Funded by:	Estimated cost A$:

Department of Environment Preliminary Screening Template

This checklist is relevant only if the developer completed a Preliminary Development Application which is an optional document if the developer choses to notify the DOE early in the planning and design phase.

The purpose of this template is for the DOE to consider the application and advise the developer of the likely EIA process, relevant environmental factors to consider and the appropriate consultation methods.

This form should not be used in place of the EIA Screening Checklist.

DOE to review Preliminary Notification, answer these questions:

☐ Consider Exemptions:

- Does the development involve:
  - The construction/renovation/ extension of a household or a church?
  - Routine maintenance of roads, airstrips, seawalls and pathways?

If yes, the development is exempt under Section 5 of the Regulations and not required to complete an EIA.

☐ Review proposal, if appropriate/necessary send information and drawings to relevant departments if appropriate (R2R, lands, Agriculture, PWD), to get feedback (memo template in file)

☐ Complete template below

1. Project details

Project name:

Project proponent (developer):

Project location:

Type and purpose of project (brief description):

2. Questions to consider

		Yes	No	NA	Unsure	Comments
2.1	Have adequate details been provided for the proposed project? (i.e., maps and designs, engineering details)?	☐	☐	☐	☐	*If no/unsure, notify developer what is required.*
2.2	Are there any factors to be considered regarding the proposed location? (e.g., appropriate set-back from the coast/shoreline; is the adjacent land use suitable? Are any historical/archaeological site or protected/conservation reserve in project footprint?)	☐	☐	☐	☐	*If no/unsure, notify developer.*
2.3	Does the project have potential to have a negative impact on the marine environment? i.e., coast, reef, sedimentation, fish habitat, etc	☐	☐	☐	☐	*If yes/unsure, notify developer of potential impacts.*

2. Questions to consider					
	Yes	**No**	**NA**	**Unsure**	**Comments**
2.4 Does the project have potential to have a negative impact on the terrestrial/vegetation environment i.e., taro swamp, species habitat, etc	☐	☐	☐	☐	*If yes/unsure, notify developer of potential impacts.*
2.5 Does the project have potential to have a negative impact on the community? i.e., livelihood, fishing grounds, areas of animal/crop production, sacred sites, religious areas	☐	☐	☐	☐	*If yes/unsure, notify developer.*
2.6 Does the project have potential to have any other negative impacts? i.e., exasperate a natural hazard, generate pollution, disturb unexploded ordinances, etc	☐	☐	☐	☐	*If yes/unsure, notify developer.*
2.7 Is the size/type of the project expected to warrant significant community/Kaupule consultation?	☐	☐	☐	☐	*If yes/unsure, send developer Consultation Checklist (Form 7)*
2.8 Does the development have the potential to contravene any conventions and international commitments Tuvalu has signed up for? (i.e., CBD, Aichi Targets, National Biodiversity Strategy; CCD, NAP; the Sustainable and Integrated Water and Sanitation Policy; Climate Change Policy and Action Plan)	☐	☐	☐	☐	*If yes/unsure, notify developer.*

Next step:

☐ Advise applicant of likely EIA process, environmental factors to consider and appropriate consultation.

☐ Advise applicant of need to complete Notification and Application for Development [Form 4]

☐ Supply applicant Consultation Checklist [Form 8] if required

Notification and Application for Development Approval

Per Section 6 of the Environmental Protection (Environmental Impact Assessment) Amendment Regulations 2017, all persons proposing to undertake any development activity must, prior to the commencement of the activity, (a) notify the Department of the proposed activity; and (b) apply for a development consent under these regulations.

This form is the formal notification of the development to the Department of Environment. Please complete all relevant sections and return to the Department. The developer should complete this form to the best of their ability and knowledge. Please contact the Department of Environment for guidance if required.

2. Applicant Details and Project Overview:

We hereby apply for development approval to undertake the following activity.

2.1 Name of proposed development:

2.2 Brief overview of proposed development, and summary of purpose and benefits?

-

2.3 The proposed activity will provide (Please tick all boxes that apply):

-

☐ Residential	☐ Commercial	☐ Recreational	☐ Infrastructure/structure
☐ Industrial	☐ Church/Religious	☐ Agricultural	☐ Educational
☐ Cultural/Community	☐ Electricity/Solar	☐ Marine/Fisheries	☐ Other - please specify: _____

2.4 Location and extent of proposed activity:

-

-

2.5 Applicant contacts:

-

Name:	Position:
Ministry/Company:	Telephone:
Address:	Email:

-

-

2.6 I am the:

☐ Property owner	☐ Developer
☐ Occupier	☐ Other

2.7 Proposed construction start date:

2.8 Estimated construction completion date:

2.9 Estimated cost A$:

2.10 Funded by:

2.11 Responsible contractor or builder (if known):

Name:

Contact details:

3. Details of The Proposal

3.1 Provide a description and overview of all components of the development.

- What structures/building, roads/driveways, are proposed?

3.2 Provide a description of expected construction methodology and duration.

3.3 What is currently on the land to be disturbed by this project – i.e., Beach? Lagoon? Vegetation? Public land? Houses?

3.4 What is immediately adjacent to the proposed development - how many households, businesses, schools etc?

-
-
-

3.5 Were alternative locations and designs considered for this development? If so, give details.

3.6 Please attach information showing:

-

1) Drawing/map location of location of proposed project. Also indicate physical features (i.e., sea, reef, lagoon, buildings, graves, trees, etc) in the vicinity.

-

2) Drawing/plans showing configuration of proposed development (i.e., proposed site plan, design drawings, elevations)

-

3) Evidence of Kaupule, community and adjacent neighbours consultation if conducted, and minutes of meetings.

4) Any other relevant drawings or information – i.e., Geotechnical, hydrology, ecology etc

4. Identification of Environmental & Social Receptors				
Will this development:	**Yes**	**No**	**Unsure**	**Details** *If yes, provide details such as size/extent of area disturbed, species affected, types of pollution, etc*
i. Take place on the beach, foreshore, reef, or lagoon?	☐	☐	☐	
ii. Require in-water dredging, reclamation or construction of a seawall, breakwater, or jetty?	☐	☐	☐	
iii. Take place within any wetland area or taro swamp?	☐	☐	☐	
iv. Require clearing of vegetation?	☐	☐	☐	
v. Require any earthworks or mining?	☐	☐	☐	
vi. Be located in any reserve or recreation areas? or restrict access to these areas?	☐	☐	☐	
vii. Impact any known species at risk, or their habitats?	☐	☐	☐	
viii. Cause erosion on site and neighbouring properties?	☐	☐	☐	
ix. Generate waste or pollution of any type?	☐	☐	☐	
x. Impact any physical or cultural resources – i.e., archaeological sites, graves	☐	☐	☐	
xi. Be subject to effects from, or increase the chances of being affected by, climate change or natural hazards - i.e., flooding, tidal or wave inundation?	☐	☐	☐	
xii. Have potential to disturb any potential area of unexploded ordinances or other contaminated site?	☐	☐	☐	
xiii. Generate any other relevant environmental issues? (e.g. noise, vibration, cumulative impact, air quality)	☐	☐	☐	
xiv. Other relevant information? - -	☐	☐	☐	

5. Land details:

If you are the owner of the proposed land, please proceed to Section 4.3.

If you are not the owner of the land, please have the landowner(s) sign their approval for this development. If the land is customary owned, you must present this application to the Chief responsible for the land.

Alternatively: please attach the lease agreement or other relevant document indicating approval for the proposed project to occupy the land.

5.1 Freehold/private land:

-

I / We _____, certify that I / We own the land described in this application and grant the applicant permission to use the land as proposed.

_____ ___/___/___
Owner Date

5.2 Customary/Kaupule/Falakaupule land:

I / We, _____ and _____ certify that I / We are chief of the _____ family, which is responsible for the land described in this application, and hereby grant permission to the applicant to use the land to which the application relates.

_____ _____ ___/____/____
Name Signature Date

_____ _____ ___/____/____
Name Signature Date

5.3 Neighbour approval:

It is important to ensure neighbours directly adjacent to the development are aware of the proposal. Please present your application to the neighbours for their consideration. Neighbours will have the opportunity to be involved in the Environment Assessment process if they have concerns with the development.

I / We certify that I / We are owners of the adjacent land and are aware of this development (provide additional pages if more signatures required).

_____ _____ ___/____/____
Name Signature Date

_____ _____ ___/____/____
Name Signature Date

6. Applicant declaration:

Information on this form is required to be provided under the EIA Amendment Regulations 2017 to process your application.

I confirm that I have read and understand the requirements of this application and certify that all of the information provided on the application form is true and correct.

_____ ____/____/____
Signature Date

_____
Print full name

Department of Environment Screening Template

Per Section 6B of the Environmental Protection (Environmental Impact Assessment) Amendment Regulations 2017, the Department of Environment must screen any development proposal using an EIA Screening Checklist. The checklist will identify potential environmental and social safeguard risks and determine under which EIA category the proposed development shall proceed.

First Steps:

Department of Environment to complete

☐ Briefly scan Notification and Application for Development Approval and check all information is provided (i.e., drawings, maps, information on all project phases)

☐ Consider Exemptions:

- Does the development involve:
  - The construction/renovation/ extension of a household or a church?
  - Routine maintenance of roads, airstrips, seawalls, and pathways?

If yes, the development is exempt under Section 5 of the Regulations and not required to complete an EIA.

☐ Send information and drawings of proposed project to relevant departments (R2R, lands, Agriculture, PWD), to get feedback (memo template [Form 5])

☐ Complete Screening Assessment (below)

1. Project details

Project name:

Project proponent (developer):

Project location:

Type and purpose of project (brief description):

2. Size/Scale and Location:

2.9 Are their adequate details proposed for the project? Does the proposal have adequate maps and designs completed by a qualified professional (i.e., engineer)?

Yes ☐ No ☐ Unsure ☐

Comments:

- *If no, notify Developer and request more information.*
-

-

2.10 What will the development entail? (i.e., modification to reef/lagoon, clearance of vegetation, dredging, etc)

2.11 Describe the existing environment of the project footprint (i.e., what land/sea will be impacted by the development (i.e., vegetation, beach, reef, private property)? Does the project footprint contain important or unique features?)

2.12 What is the adjacent land use? How many residential properties? Businesses? School? Beach or other public space?

2.13 What is the expected timeframe for project construction and operation?

3. General Questions

	Yes	No	NA	Unsure	Comments	Include in TOR?[37]
3.1 Is the proposed site suitable for the project? (e.g., appropriate set-back from the coast, shoreline; not adjacent to an historical/archaeological site or protected/conservation reserve, school, or hospital)	☐	☐	☐	☐	*Comments if required:* *If no, is this something the EIA should consider?*	☐
3.2 Have alternatives been considered?	☐	☐	☐	☐	*Comments if required:* *If no, is this something the EIA should consider?*	☐
3.3 Are proposed activities unusual, large, or unique activities for Tuvalu?	☐	☐	☐	☐	*Comments if required:*	☐
3.4 Is adequate consultation undertaken/underway? Are adjacent neighbours aware?	☐	☐	☐	☐	*If no, briefly describe:* *If no, send developer Consultation Checklist (Form 7)*	☐
3.5 Is the proposed project site customary land? Are all customary landowners aware of the project proposal?	☐	☐	☐	☐	*If no, briefly describe:* *If no, send developer Consultation Checklist (Form 7)*	☐
3.6 Will the project have positive benefits for the community?	☐	☐	☐	☐	*Comments if required:*	☐

[37] ***Does the impact need to be further investigated? Will it require management? Are conditions of consent required?***

3.7 Is the project designed to assist with climate change? (I.e., Sea level rise, flooding?)	☐	☐	☐	☐	*Comments if required:*	☐
3.8 Does the project have consideration for potential future climate change effects (i.e., is it set back appropriately from the coastline?)	☐	☐	☐	☐	*If no, briefly describe:* *If no, consider including on TOR. Developer to include details in EIA.*	☐
3.9 Are there any other project projects proposed in the area this project might act cumulatively with?	☐	☐	☐	☐	*If yes, briefly describe:* *If yes or unsure, consider including on TOR. Developer to include details in EIA*	☐
3.10 Is this development contravening any conventions and international commitments Tuvalu has signed up for? (i.e., CBD, Aichi Targets, National Biodiversity Strategy; CCD, NAP; the Sustainable and Integrated Water and Sanitation Policy; Climate Change Policy and Action Plan)	☐	☐	☐	☐	*If yes, briefly describe:* *If yes or unsure, consider including on TOR. Developer to include details in EIA*	☐
4. Environmental Effects:						
Questions	Yes	No	NA	Unsure	**Brief summary: i.e., Significant impact? Negative or positive? Long-term, short-term, or irreversible?**	**Include in TOR?**[38]
<u>Marine Environment:</u>						
4.1 Is the project located within or adjacent to a Local Marine Management Area (LMMA), or any other marine/coastal protected/conservation area	☐	☐	☐	☐	*If yes or unsure, notify developer. Project location may need to be reconsidered.*	☐
4.2 Will the project result in any changes to the marine environment or foreshore – i.e., coral, reef, or lagoon environment? or changed tidal patterns? Changes to fish habitat? Changes to areas of scientific value?	☐	☐	☐	☐	*If yes, describe impact – i.e., Significant impact? Negative or positive? Long-term, short-term, or irreversible?*	☐
4.3 Will the project result in sedimentation of the lagoon?	☐	☐	☐	☐	*If yes, describe impact (from 4.2)*	☐
4.4 Will the project damage any areas of fish habitat? particularly any nursery or spawning area	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is the habitat significant?*	☐
4.5 Will the project damage any marine vegetation communities? - i.e., mangrove, sea grass	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is the vegetation significant?*	☐

Terrestrial Environment:						☐
4.6 Is the project located within or adjacent to a Land Protection Area or any conservation area?	☐	☐	☐	☐	*If yes or unsure, notify developer. Project location may need to be reconsidered.*	☐
4.7 Will the project result in clearance of any vegetation communities (i.e., coconut trees, taro swamp)	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is the vegetation significant?*	☐
4.8 Will the project damage any bird habitat? Particularly rare, threatened, or endangered species?	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is the habitat significant?*	☐
4.9 Will the project result in any changes to other species' habitat? Particularly rare, threatened, or endangered species? Changes to areas of scientific value?	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is the habitat significant?*	☐
4.10 Does the project have the potential to introduce invasive species? (i.e., weeds, koe leafworm)	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is it a significant risk?*	☐
4.11 Will the project result in erosion or increase flooding of adjacent properties?	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is it a significant risk?*	☐
Community:						☐
4.12 Will the project result in any changes to the economic or livelihood of the community? (i.e., fishing grounds, areas of animal/crop production?)	☐	☐	☐	☐	*If yes, describe impact (from 4.2), could the change be considered significant to the community?*	☐
4.13 Will the project result in any changes to cultural areas? (i.e., sacred sites, religious areas?)	☐	☐	☐	☐	*If yes, describe impact (from 4.2)*	☐
4.14 Will the project result in any changes to public and recreation areas or access to these areas?	☐	☐	☐	☐	*If yes, describe impact (from 4.2)*	☐
4.15 Will the project have any impact on vulnerable groups and gender/women?	☐	☐	☐	☐	*If yes, describe impact (from 4.2)*	☐
4.16 Does the project have the potential to increase health and safety hazards or risks for people? (i.e., use of potentially harmful substances, disturbance of contaminated sites?)	☐	☐	☐	☐	*If yes, describe impact (from 4.2)*	☐
Climate Change:						☐
4.17 Will the project increase the risk of shoreline change or coastal erosion? Associated with high tides, sea-level rise, large swells, extreme rainfall, or storm-related events?	☐	☐	☐	☐	*If yes, describe impact (from 4.2)*	☐
4.18 Will the project increase the chances of occurrence of natural hazards such as flooding, tidal or sea wave inundation?	☐	☐	☐	☐	*If yes, describe impact (from 4.2), is it a significant risk?*	☐
Pollution:						☐

4.19 Will the project generate pollution? (i.e., solid waste (rubbish), liquid waste, air emissions etc)?	☐	☐	☐	☐	*If yes, describe type of pollution. Could there be a negative impact to the community?*	☐
4.20 Will the project result in the generation of hazardous substances? (i.e., hydrocarbons, chemical spray)	☐	☐	☐	☐	*If yes, describe type of pollution. Is there an impact to the community?*	☐
Other:						☐
4.21 Are utility services available and adequate for the project? (i.e., power, water, sewerage)	☐	☐	☐	☐	*If no, describe briefly.*	☐
4.22 Will the project generate any other relevant environmental issues? (e.g., noise, vibration, dust)	☐	☐	☐	☐	*If yes, describe briefly.*	☐
4.23 Does the project have the potential to disturb any potential area of unexploded ordinances or other contaminated site?	☐	☐	☐	☐	*If yes, describe briefly.*	☐
4.24 Are there any other potential impacts to warrant further investigation?	☐	☐	☐	☐	*If yes, describe briefly.*	☐
4.25 Other effects	☐	☐	☐	☐	*If yes, describe briefly.*	☐

Further Comments:

5. **Determination of Required EIA**

Based on the above assessment, is the activity deemed to:	**No**	**Yes**	**If yes, EIA Type**
Result in broad, diverse and potentially irreversible adverse impacts, major resettlement, conversion of natural habitats and involves the use of hazardous materials –	☐	☐	**Category A** Full EIA required
Result in development activities that are geographically limited with readily identified adverse impacts that can be mitigated -	☐	☐	**Category B** Preliminary EIA required. ***** (11)(1) After considering a preliminary report and the recommendation given by the Department, the Minister may give notice in writing to the proponent that a full assessment is required in accordance with Part III
Result in development activities with negligible or minimal potential adverse impacts that are easily mitigated, or development is exempted from EIA under Section 5.	☐	☐	**Category C** No EIA required. Activity approved with: ☐ Conditions attached to the development approval.

			☐ No conditions recommended.

Category C Conditions:

Category of Activity and EIA Recommended:

☐ Category A – Full EIA
☐ Category B – Preliminary EIA
☐ Category C – No EIA, with conditions
☐ Category C – No EIA, no conditions

Reasons for recommendation:

6. Sign off

Screening officer name: Signature:

Date:

Director of Environment Signature:

Date:

Next steps

Department to complete

Category A – Full EIA
☐ Notify Developer of decision – share Screening decision and complete Scoping/TOR [Form 7]
☐ Supply Consultation template to developer [Form 8]
☐ Form Task Force

Category B – Preliminary EIA
☐ Notify Developer of decision – share Screening decision and complete Scoping/TOR [Form 7]
☐ Supply Consultation template to developer if further consultation is required [Form 8]

Category C – No EIA, conditions
☐ Write conditions [Form 9]

☐ Approval letter sent to developer, including conditions and monitoring. <u>Category C – No EIA, no conditions</u> ☐ Approval letter sent to developer.

<u>Scoping Template</u>

Per Section 6C of the Environmental Protection (Environmental Impact Assessment) Amendment Regulations 2017, the Department must complete scoping where the screening process assesses a development activity either as a category A or B.

The outcome of EIA scoping is a set of Terms of Reference (TOR) that outline the required content, and provide advice on the format, of an EIA report. The TOR help proponents and consultants prepare an EIA report with sufficient and relevant information, so that a project's environmental consequences can be adequately analyzed and understood.

<u>Important note:</u> This Tuvalu Department of Environment TOR shall be read in conjunction with the TOR of funding agencies and other bodies involved in this project. It does not take precedence over any other TOR and other identified environmental factors to be considered.

Section 1 – Project details
Project name: Project proponent (developer):
Preliminary Assessment:
This section applies if the development is deemed to require a Preliminary EIA Assessment under Section 5 of the EIA Screening Template. This list forms the ToR to guide the Preliminary EIA Assessment as requested by the Department.
TOR for Preliminary EIA
- Description of the development proposal
- Justification for the development proposal
- Location map, site plan, detailed drawing of proposed project
- Description of the area to be affected (including description of existing land use, vegetation types, species habitats, cultural areas, etc. Detailed mapping to be included as appropriate)
- Summary of consultation undertaken (see DOE consultation checklist)
- Assessment of foreseeable environmental impacts, with particular focus on the following: *Note: As discussed above, this list includes the environmental factors deemed important by the Tuvalu Dept of Environment. It is not an exclusive list and shall be read in conjunction with the TOR of funding agencies and other bodies involved in this project.*

- Describe alternatives considered and measures proposed to mitigate or avoid identified adverse impacts.
- Assessment of foreseeable social impacts, including: employment opportunities; housing; utilities, public health and safety; cultural heritage and resources of cultural, archaeological or historical value; and gender inequalities including women employment. - Describe alternatives considered and measures proposed to mitigate or avoid identified adverse impacts.
- Environmental Management Plan Table showing potential environmental impacts and what mitigation measures proposed to be employed to minimize environmental effects
1. Full Assessment:
This section applies if the development is deemed to require a Full EIA Assessment under Section 5 of the EIA Screening Template. This list forms the ToR to guide the Full EIA Assessment as requested by the Department.
TOR for Full EIA
- Description of the proposed development, including full description of construction duration and methodology
- Purpose and objectives of the project
- The precise location and boundaries of the proposal shown on a detailed map
- Detailed engineering plans and other relevant drawings of proposed project
- Summary of alternatives considered, including locations and methods, and the alternative of no action
- Summary of consultation undertaken (what Kaupule consultation/community meetings etc., number of attendees, and summary of discussions and findings) (see DOE consultation checklist)
- A description of existing environment including: - A description of the existing environment in the project area – i.e., vegetation communities, marine species, and coral, with particular focus on endangered species and habitats - A description and modelling (if relevant) of current functions of lagoon and marine environment in the project area - Description of current and potential future use of adjacent properties - Summary of historic and cultural use of the project footprint - Summary of proposed future projects in the vicinity of the project area - Other appropriate studies, drawings and/or data, if relevant

- Assessment of foreseeable environmental impacts, with particular focus on the following: - Consider long-term and short-term impacts, adverse and positive impacts, and primary and secondary consequences. - summary of their significance and risks - a consideration of cumulative environmental impacts (impacts that may occur in combination with other activities in the location) - Describe alternatives considered and measures proposed to take to mitigate or avoid identified adverse impacts.
- Assessment of foreseeable social impacts, including: employment opportunities; housing; utilities, public health and safety; cultural heritage and resources of cultural, archaeological or historical value; and gender inequalities including women employment. Particular focus on the following: Describe alternatives considered and measures proposed to mitigate or avoid identified adverse impacts.
- Statement of all major conclusions, highlighting any unavoidable adverse environmental impacts, issues that are controversial and or that remain to be resolved.
- A list of all persons who prepared the EIA, their qualifications.
- Environmental Management Plan Table showing potential environmental impacts and what mitigation measures proposed to be employed to minimize environmental effects.

Consultation Checklist

Per Section 16 of the Environmental Protection (Environmental Impact Assessment) Amendment Regulations 2017, the Department must ensure public consultation is completed appropriately to the scale of the development. Public consultation is most important in relation to a full EIA assessment.

The proponent must carry out public awareness and consultations with the affected community, Government and community stakeholders during the environmental impact assessment process and the implementation of the development, where it is necessary to address any environmental concerns that arise before and after approval is granted.

The DOE should ensure the following level of consultation occurs during the EIA process. Supply the checklist to the developer as necessary so they are aware of the expectation for consultation.

Preliminary assessment:

Proponents to supply:

☐ List of affected groups/communities and the relevant stakeholders, considering gender and disadvantaged groups as appropriate – i.e., Kaupule, Falakaupule, adjacent landowners, women's groups, youth groups, church, etc

☐ What consultation has been undertaken.

☐ Supply minutes and/or photos of consultation sessions.

☐ Summary of discussion and any amendments to the proposal based on feedback.

☐ Signed approval of project from Kaupule, Falakaupule, and landowner(s). Also, adjacent landowners if appropriate.

Full EIA Assessment:

Proponents to supply evidence to show:

☐ Supply consultation plan showing list of affected groups/communities and the relevant stakeholders, considering gender and disadvantaged groups, and non-island groups as appropriate (i.e., Kaupule, adjacent landowners, women's groups, youth groups, church, etc). Plan to include:

- what consultation is proposed with each group.
- how each group will be notified about the project
- how proponent will allow for equal participation by all affected groups (including women and youth groups)

☐ Supply presentations and summary of information disclosed to show the WHOLE project has been communicated with each group, i.e., not the information on the purpose and benefits of the project, but include details on the construction phase, trade-offs, potential environmental and social changes etc.

☐ Supply minutes and/or photos of consultation sessions.

☐ Summary of discussion and any amendments to the proposal based on feedback.

☐ Signed approval of project from Kaupule, Falakaupule, and landowner(s). Also, adjacent landowners if appropriate

EMP/Construction Monitoring

The following template assist in routine EMP supervision by the DOE and the Contractor's Environment Specialist. Consider getting the R2R environmental officers to complete these regularly.

MITIGATION COMPLIANCE & INSPECTION MONITORING FORM			
Development name and location:		**Applicant:**	
Date:		**Contractor:**	
Attendees (name & department)			
Attendees (name & department)			

Construction Activity	Mitigation Measure (as per EMP)	Mitigation Implemented Yes/No	Mitigation Effective* 1 to 5	Actions required
e.g., dredging of reef	*Sedimentation control – use of a silt curtain, in-water construction only during outgoing tides*	*No*	*0*	*Contractor to ensure silt curtain is in place during in water work to assist with sedimentation control. Implement immediately. Supply evidence to DOE by way of photographs.* *Contractor to ensure in-water construction is completed only during outgoing tides. Implement immediately. Supply evidence to DOE by way of construction work plans.*

- *Mitigation Effectiveness Rating Criteria
  1 = Very Good, 5 = Very Poor

Attachments (E.g., Photos, Remarks, laboratory reports etc.)

Funafuti Kaupule Letter of Endorsement for the PRF to perform surveys for the FWSSP Water Supply Pipeline Service Area to 2050 to be located within road easements

KAUPULE FUNAFUTI
Luapou, Funafuti
Phone: 68820422, 68820423 e.kausea@kaupulefunafuti.com

16 Mee 2023

KAUPULE FUNAFUTI
DATE: 16/05/23

Faatasi Malologa
Director
Department of Lands and Survey
Office of the Prime Minsiter

Mataupu: Tali ki te manakoga ke toe fai Saveaga fakalei o te Fakai o Funafuti mai Sulani Shop Vaiaku kit e Funafuti Fusi.

Talofa Tou 'Malu

Ko ala atu te tusi tenei o fakaoko atu te tali ki te manakoga te lua ofisa ne fakaoko mai ki te Kaupule i te po 31 Maati 2023.

Ne avaka fakamataupu te manakoga koulua ite Fonotaga Falekaupule i te po 13 Apelila 2023. Ne fakatalia te mataupu mo te manakoga te Falekaupule ke fai ne fakatokaga lei te Komiti te FNLTB mo te lua ofisa ki te faiga te galuega ki te Saveaga te fakai o Funafuti. Mo te vaitau nei seki toka fakatokaga kona.
Ko tulaga o te manakoga fakavave tenei ko too mai i te polotieki te FWSP, ko oti ne fakatalia ke kamata te galuega koulua tena ki te saveaga o auala kola ka fakamoe iei a pipe o te polotieki tenei. **Te taliaga tenei mo kogakoga fua kona o te polotieki ke mafai la o toka ki te kamataga o te polotieki.**
Te taliaga fakavave tenei e pogai mai luga i te kiloga i kogakoga konei e fakamoe iei a pipes e too i loto i manafa liisi ate Malo, tela e toka koulua o fakakatoatoa a manakoga kona ke fakagofie kiei te saveaga ke mafai o fakamape a auala. Ke toka atu te feitu maua mai konei ki te saveaga te fakai ko fakailoa atu iei ke mafai o galue tasi te lua ofisa mo te Komiti tenei.

Ka isi ne fakafesiliga mai i te lua feitu, e toka au o agai atu I sose taimi galue io me meli mai ki taku meli iti e.kausea@kaupulefunafuti.tv.

Fakaaetai lasi

KAUPULE O FUNAFUTI

Emileta Kausea
Kaupule Funafuti

Cc: Feagaiga Penivao
Emma P Lauti

English Translation of Letter

KAUPULE FUNAFUTI
Luapou, Funafuti
Phone: 68820422, 68820423 e.kausea@kaupulefunafuti.com

19th May 2023

TO WHOM IT MAY CONCERN

Consent - request regard the land survey for the FWSP

In reference to the Funafuti Falekaupule meeting on the 13th April, 2023, the request regard the land survey was approved.

Due to issues previously encountered from Land Survey on the main Funafuti settlement, the Falekaupule turned to the Funafuti Native Land Trust Board to oversee the Survey. At the meantime the Land survey was put on hold until further notice due to the FNLTB commitment to other priority matters.

With regard to the urgent need proposed by the Funafuti Water and Sanitation Project, the land survey was reconsidered because the areas needed for the project doesn't require a major survey within the main settlement. The consent was sent on the 16th May 2023 to the Lands and Survey department specifically for the areas required for the FWSP.

Please don't hesitate to contact me if need for further information on this matters.

Sincerely,

Enileta Kausea
Secretary
Funafuti Council

List of 2021/2022 Payment for Funafuti Road Easement Leases for Projected Water Supply Pipeline Service Area to 2050

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
1	Lasaini Esau LCAP C#:1/2020	Tealapae	26 (r)	0.03	$7,500.00	$225.00	$225.00	$225.00		$225.00
2	Aloseta Teikafili	Nanumasa	34 (au)	0.05	$7,500.00	$375.00	$375.00	$1,725.00		$1,725.00
		Matafenua Tevakatoetoe	143 (k)	0.07	$7,500.00	$525.00	$525.00			
		Sumi	7 (t)	0.02	$7,500.00	$150.00	$150.00			
		Lofeagai	22 (au)	0.04	$7,500.00	$300.00	$300.00			
		Latalua	23 (ao)	0.05	$7,500.00	$375.00	$375.00			
3	Safoka (Apelila S)	Sumi	7 (f)	0.05	$7,500.00	$375.00	$375.00	$375.00		$375.00
4	Sotia Kolone (Ave) (LC#:2/2015)	Toli	137 (ae)	0.03	$7,500.00	$225.00	$225.00	$225.00		$225.00
5	Senitelela Tapu LC#: 4/2016	Folokolupe	9 (t)	0.05	$7,500.00	$375.00	$375.00	$6,375.00		$6,375.00
		Teatuafulufulu	18 (u)	0.06	$7,500.00	$450.00	$450.00			
		Tumu	21 (i)	0.08	$7,500.00	$600.00	$600.00			
		Latalua	23 (f)	0.06	$7,500.00	$450.00	$450.00			
		Latalua	23 (s)	0.06	$7,500.00	$450.00	$450.00			
		Akimoa	27 (a)	0.07	$7,500.00	$525.00	$525.00			
		Funafou	47 (e)	0.05	$7,500.00	$375.00	$375.00			
		Niua	80 (l)	0.04	$7,500.00	$300.00	$300.00			
		Tugafale ite Fakai	76 (a)	0.03	$7,500.00	$225.00	$225.00			
		Vaitekele	59 (ng)	0.07	$7,500.00	$525.00	$525.00			
		Nanumasa	34 (aa)	0.03	$7,500.00	$225.00	$225.00			
		Teatupua		0.16	$7,500.00	$1,200.00	$1,200.00			
		Matafenua Tevakatoetoe	143 (f)	0.05	$7,500.00	$375.00	$375.00			
		Laumanifi	136 (r)	0.04	$7,500.00	$300.00	$300.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
6	Soloseni Penitusi	Sumi	7 (e)	0.02	$7,500.00	$150.00	$150.00	$2,250.00		$2,250.00
		Tealapae	26 (p)	0.07	$7,500.00	$525.00	$525.00			
		Vao	87 (u)	0.07	$7,500.00	$525.00	$525.00			
		Laumanifi	136 (t)	0.04	$7,500.00	$300.00	$300.00			
		Sapalau	125(l)	0.1	$7,500.00	$750.00	$750.00			
7	Penipelite T.(Kaitu N)	Lofeagai	22 (k)	0.05	$7,500.00	$375.00	$375.00	$2,857.50		$2,857.50
		Latalua	23 (m)	0.06	$7,500.00	$450.00	$450.00			
		Teavaamagoo	31 (ng)	0.06	$7,500.00	$450.00	$450.00			
		Teasagatai	92 (i)	0.04	$7,500.00	$300.00	$300.00			
		Tugafale	83 (a)	0.001	$7,500.00	$7.50	$7.50			
		Talamaiava	53 (f)	0.04	$7,500.00	$300.00	$300.00			
		Laugaisave	142 (m)	0.06	$7,500.00	$450.00	$450.00			
		Laugaisave	142 (i)	0.04	$7,500.00	$300.00	$300.00			
		Tegaoa	140 (m)	0.03	$7,500.00	$225.00	$225.00			
8	Kaivale Tila							$1,500.00		
		Laumanifi	136 (e)	0.03	$7,500.00	$225.00				
		Folokovao	6 (l)	0.06	$7,500.00	$450.00				
		Latalua	23 (t)	0.03	$7,500.00	$225.00				
		Matalagi	24 (s)	0.04	$7,500.00	$300.00				
		Laugaisave	142 (v)	0.04	$7,500.00	$300.00				
	Falesa(Falesa)1/3						$500.00		Falesa(Falesa)1/3	$500.00
	Panapa Isaia(Kaivale) 1/3 LC# 6/12						$500.00		Panapa Isaia(Kaivale) 1/3 LC# 6/12	$500.00
	Vaomua(Vaomua)1/3						$500.00		Vaomua(Vaomua)1/3	$500.00
9	Anitelea Omeli	Laumanifi	136 (ae)	0.02	$7,500.00	$150.00	$150.00	$1,650.00		$1,650.00
	LC#: 38/13	Saumalei	20 (u)	0.06	$7,500.00	$450.00	$450.00			
		Tealapae	26 (f)	0.05	$7,500.00	$375.00	$375.00			
		Toli	137 (ai)	0.06	$7,500.00	$450.00	$450.00			
		Nukuatea	25 (af)	0.03	$7,500.00	$225.00	$225.00			
10	Kakee Pese	Tepapa	134 (ao)	0.01	$7,500.00	$75.00	$75.00	$75.00		$75.00
11	Sagatua Teo	Lofeagai	22 (ae)	0.04	$7,500.00	$300.00	$300.00	$675.00		$675.00
		Teone	30 (o)	0.05	$7,500.00	$375.00	$375.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
12	Vaitusi Tevakaniu LC #: 7/2016	Vao	87(1)	0.03	$7,500.00	$225.00	$225.00	$225.00		$225.00
13	Kamuta.L	Matafenua Tevakatoetoe	143 (i)	0.03	$7,500.00	$225.00	$225.00	$4,950.00		$4,950.00
		Folokovao	6 (ang)	0.08	$7,500.00	$600.00	$600.00			
		Folokolupe	9 (l)	0.04	$7,500.00	$300.00	$300.00			
		Matalagi	24 (a)	0.07	$7,500.00	$525.00	$525.00			
		Akimoa	27 (u)	0.21	$7,500.00	$1,575.00	$1,575.00			
		Nanumasa	34 (ng)	0.19	$7,500.00	$1,425.00	$1,425.00			
		Luapou	45 (o)	0.02	$7,500.00	$150.00	$150.00			
		Sapii	46 (o)	0.02	$7,500.00	$150.00	$150.00			
14	Puleua Savelio (Kiteao)	Matalagi	24 (aa)	0.03	$7,500.00	$225.00	$225.00	$450.00		$450.00
		Tokotu	103(e)	0.03	$7,500.00	$225.00	$225.00			
15	Teleke Peleti (GC)10/2018)	Matafenua Tevakatoetoe	143 (t)	0.1	$7,500.00	$750.00	$750.00	$3,450.00		$3,450.00
		Folokolupe	9 (v)	0.03	$7,500.00	$225.00	$225.00			
		Folokolupe	9 (k)	0.02	$7,500.00	$150.00	$150.00			
		Teatuafulufulu	18 ( )	0.07	$7,500.00	$525.00	$525.00			
		Latalua	23 (ae)	0.03	$7,500.00	$225.00	$225.00			
		Teavaamagoo	31 (f)	0.04	$7,500.00	$300.00	$300.00			
		Fanuafou	47 (i)	0.05	$7,500.00	$375.00	$375.00			
		Niua	80 (o)	0.03	$7,500.00	$225.00	$225.00			
		Lotomua	33 ()	0.04	$7,500.00	$300.00	$300.00			
		Tegaoa ki Sulu	141 (i)	0.05	$7,500.00	$375.00	$375.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
16	Laloniu	Toli	137 (s)	0.05	$7,500.00	$375.00	$375.00	$375.00		$375.00
17	Sokomani, Simona & Manipola	Tealapae	26 (v)	0.04	$7,500.00	$300.00		$4,500.00		
		Laumanifi	136 (u)	0.13	$7,500.00	$975.00				
		Toli	137 (au)	0.05	$7,500.00	$375.00				
		Nukuatea	25 (ng)	0.03	$7,500.00	$225.00				
		Sumi	7 (i)	0.06	$7,500.00	$450.00				
		Latalua	23 (p)	0.04	$7,500.00	$300.00				
		Tealapae	26 (t)	0.07	$7,500.00	$525.00				
		Teone	30 ( )	0.05	$7,500.00	$375.00				
		Tepule	55 (a)	0.03	$7,500.00	$225.00				
		Vailaloniu	90 (a)	0.03	$7,500.00	$225.00				
		Sapii	46 (a)	0.07	$7,500.00	$525.00				
	Tutasi Toma						$600.00		Tutasi Toma	$600.00
	Viliamu Liveti						$600.00		Viliamu Liveti	$600.00
	Laisini Papamau						$600.00		Laisini Papamau	$600.00
	Salome-Teleke						$600.00		Salome-Teleke	$600.00
	Puava Lalua - Taulagi (LC#: 15/2013)						$600.00		Puava Lalua - Taulagi (LC#: 15/2013)	$600.00
	Tui Peniasi - Siliga						$1,500.00		Tui Peniasi - Siliga	$1,500.00

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
18	Levolo.F	Sumi	7 (s)	0.04	$7,500.00	$300.00		$4,275.00		
		Sumi	7 (l)	0.04	$7,500.00	$300.00				
		Lofeagai	22 (i) & 22(o)	0.07	$7,500.00	$525.00				
		Lofeagai	22 (e)	0.02	$7,500.00	$150.00				
		Matalagi	24 (i)	0.01	$7,500.00	$75.00				
		Nukuatea	25 (i)	0.08	$7,500.00	$600.00				
		Akimoa	27 (o)	0.14	$7,500.00	$1,050.00				
		Teavaamagoo	31 (o)	0.08	$7,500.00	$600.00				
		Tepule	55 ( )	0.04	$7,500.00	$300.00				
		Falesa	74 (e)	0.02	$7,500.00	$150.00				
		Vaotai	87(r)	0.03	$7,500.00	$225.00				
	Shared as follows LC#: 18/13									
	Sioni (Mailagi)						$712.50		Sioni (Mailagi)	$712.50
	Levolo (Teiloga)						$712.50		Levolo (Teiloga)	$712.50
	Taulamati (Selipe)						$712.50		Taulamati (Selipe)	$712.50
	Polau (Savali)						$712.50		Polau (Savali)	$712.50
	Moemoe (Setefano)						$712.50		Moemoe (Setefano)	$712.50
	Lita						$712.50		Lita	$712.50

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022

No	Landowner	Land_Name	Reg_No	Acreage	$7,500.00 Rate	Rent	Distribution	Total Rent	Payee	Payment
19	Suluelise Asuelu (Liuvaka) LC#6/2015	Nauti Primary School		0.05	$7,500.00	$375.00	$375.00	**$375.00**		**$375.00**
20	Teo Pasifika	Tepapa	134 (ai)	0.03	$7,500.00	$225.00	$225.00	**$11,955.00**		**$11,955.00**
		Folokolupe	9 (i)	0.04	$7,500.00	$300.00	$300.00			
		Teasagataupaka	19 (o)	0.48	$7,500.00	$3,600.00	$3,600.00			
		Saumalei	20 (ng)	0.04	$7,500.00	$300.00	$300.00			
		Tumu	21 (a)	0.02	$7,500.00	$150.00	$150.00			
		Tumu	21 (e)	0.02	$7,500.00	$150.00	$150.00			
		Lofeagai	22 (ng)	0.04	$7,500.00	$300.00	$300.00			
		Lofeagai	22 (aa)	0.02	$7,500.00	$150.00	$150.00			
		Latalua	23 (aa)	0.05	$7,500.00	$375.00	$375.00			
		Matalagi	24 (ao)	0.04	$7,500.00	$300.00	$300.00			
		Nukuatea	25 (a)	0.04	$7,500.00	$300.00	$300.00			
		Tealapae	26 (i)	0.04	$7,500.00	$300.00	$300.00			
		Teone	30 (m)	0.04	$7,500.00	$300.00	$300.00			
		Teavaamagoo	31 (i)	0.06	$7,500.00	$450.00	$450.00			
		Nanumasa	34 (ae)	0.04	$7,500.00	$300.00	$300.00			
		Mulipatai	89 (f)	0.04	$7,500.00	$300.00	$300.00			
		Vailaloniu	90 ( )	0.04	$7,500.00	$300.00	$300.00			
		Vao	87 (o)	0.03	$7,500.00	$225.00	$225.00			
		Vao	87 (a)	0.13	$7,500.00	$975.00	$975.00			
		Matautu	81 (o)	0.004	$7,500.00	$30.00	$30.00			
		Malugata	57 (o)	0.08	$7,500.00	$600.00	$600.00			
		Nauti Primary School		0.03	$7,500.00	$225.00	$225.00			
		Vao	87 (e)	0.06	$7,500.00	$450.00	$450.00			
		Laumanifi	136 (a)	0.02	$7,500.00	$150.00	$150.00			
		Tegaoa	140 (e)	0.02	$7,500.00	$150.00	$150.00			
		Tegaoa ki Sulu	141 (e)	0.03	$7,500.00	$225.00	$225.00			
		Laugaisava	142 (s)	0.03	$7,500.00	$225.00	$225.00			
		Laugaisave	142 ( )	0.08	$7,500.00	$600.00	$600.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022

No	Landowner	Land_Name	Reg_No	Acreage	$7,500.00 Rate	Rent	Distribution	Total Rent	Payee	Payment
21	Lui	Nukuatea	25 (o)	0.02	$7,500.00	$150.00	$150.00	$450.00		$450.00
		Lotomua	33 (n)	0.04	$7,500.00	$300.00	$300.00			
22	Taani Luki LC#: 23/21(Luki. Taniela)	Teone	30 (a)	0.05	$7,500.00	$375.00	$375.00	$1,575.00		$1,575.00
		Tepapa	134 (m)	0.01	$7,500.00	$75.00	$75.00			
		Teatuafulufulu	18 (i)	0.05	$7,500.00	$375.00	$375.00			
		Matalagi	24 (r)	0.05	$7,500.00	$375.00	$375.00			
		Tegaoa	140 (f)	0.05	$7,500.00	$375.00	$375.00			
23	Maene I	Laugaisave	142 (o)	0.04	$7,500.00	$300.00	$300.00	$1,125.00		$1,125.00
		Fakai Tegako	12 ( )	0.02	$7,500.00	$150.00	$150.00			
		Saumalei	20 (p)	0.03	$7,500.00	$225.00	$225.00			
		Matalagi	24 (v)	0.05	$7,500.00	$375.00	$375.00			
		Vailele	86 (u)	0.01	$7,500.00	$75.00	$75.00			
24	Alama M (Malau Alama)	Niua	80 (p)	0.04	$7,500.00	$300.00	$300.00	$1,050.00		$1,050.00
		Folokovao	6 (af)	0.03	$7,500.00	$225.00	$225.00			
		Tepapa	134 (?)	0.05	$7,500.00	$375.00	$375.00			
		Laugaisave	142 (t)	0.02	$7,500.00	$150.00	$150.00			
25	Elaine (Melialofa)	Tepapa	134 ( )	0.02	$7,500.00	$150.00	$150.00	$900.00		$900.00
		Matautu	81 (a)	0.04	$7,500.00	$300.00	$300.00			
		Toli	137 (an)	0.03	$7,500.00	$225.00	$225.00			
		Laugaisave	142 (ng)	0.03	$7,500.00	$225.00	$225.00			
26	Mesaako.U	Teasagataupaka	19 (e)	0.09	$7,500.00	$675.00	$675.00	$1,050.00		$1,050.00
		Vaotai	87 (n)	0.03	$7,500.00	$225.00	$225.00			
		Tepapa	134 (ng)	0.02	$7,500.00	$150.00	$150.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
	Fealofani	**Matafenua Tevakatoetoe**	143 (s)	0.03	$7,500.00	$225.00				
	Share as follows	**Sumi**	7 (ng)	0.05	$7,500.00	$375.00				
		Niua	80 (?)	0.05	$7,500.00	$375.00				
		Tokotu	?	0.03	$7,500.00	$225.00				
	Foupula and Galifale 1/2 each									
27								**$1,200.00**		
	Galifale (Lupe S)						**$600.00**		**Galifale (Lupe S)**	**$600.00**
	Fealofani 1/5 of Foupula half						**$120.00**		**Fealofani 1/5 of Foupula half**	**$120.00**
	Lota Misi (Misi) 1/5 (LC#: 01/2013)						**$120.00**		**Lota Misi (Misi) 1/5 (LC#: 01/2013)**	**$120.00**
	Lisi A (Lisi S) 1/5						**$120.00**		**Lisi A (Lisi S) 1/5**	**$120.00**
	Enele (Foupula) 1/5						**$120.00**		**Enele (Foupula) 1/5**	**$120.00**
	Lupe 1/5						**$120.00**		**Lupe 1/5**	**$120.00**

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
	Fealofani and others	Latalua	23 (o)	0.05	$7,500.00	$375.00				
		Tealapae	26 (l)	0.05	$7,500.00	$375.00				
	Fealofani Share as follows: 1/5 each				$187.50					
	Fealofani 1/5						$37.50		Fealofani 1/5	$37.50
	Lota Misi(Misi) 1/5 (LC#: 01/2013)						$37.50		Lota Misi(Misi) 1/5 (LC#: 01/2013)	$37.50
	Liisi A (Liisi S) 1/5						$37.50		Liisi A (Liisi S) 1/5	$37.50
	Enele (Foupula) 1/5						$37.50		Enele (Foupula) 1/5	$37.50
	Lupe S 1/5						$37.50		Lupe S 1/5	$37.50
	Suka (Litia) App. Case No: 18/2011				$187.50					
28	Shared as folloews:							$750.00		
	Suka T 3/7						$80.36		Suka T 3/7	$80.35
	Siketi T 2/7						$53.57		Siketi T 2/7	$53.55
	Litia Leo 1/7						$26.79		Litia Leo 1/7	$26.80
	Motuomanu 1/7						$26.79		Motuomanu 1/7	$26.80
	Talaapa Siona (Pesiki)				$187.50		$187.50		Talaapa Siona (Pesiki)	$187.50
	Mili Teleke (Mitiana) (LC#: 05/2013)				$187.50		$37.50		Mili Teleke (Mitiana) (LC#: 05/2013)	$37.50
	Tanielu Maleko (LC#: 02/2013)						$37.50		Tanielu Maleko (LC#: 02/2013)	$37.50
	Pelesie (Tevao)						$37.50		Pelesie (Tevao)	$37.50
	Lola B						$37.50		Lola B	$37.50
	Maike T						$37.50		Maike T	$37.50
29	Moeava	Saumalei	20 (o)	0.03	$7,500.00	$225.00	$225.00	$825.00		$825.00
		Matautu	81 (f)	0.03	$7,500.00	$225.00	$225.00			
		Sapii	46 (ng)	0.05	$7,500.00	$375.00	$375.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
30	Mofete Naseli	Laumanifi	136 (l)	0.03	$7,500.00	$225.00	$225.00	$1,575.00		$1,575.00
		Folokolupe	9 (ng)	0.04	$7,500.00	$300.00	$300.00			
		Teavaamagoo	31 (u)	0.07	$7,500.00	$525.00	$525.00			
		Vaitekele	59 (i)	0.07	$7,500.00	$525.00	$525.00			
31	Penileta Setema	Folokolupe	9 (e)	0.03	$7,500.00	$225.00	$225.00	$7,425.00		$7,425.00
		Folokolupe	9 (o)	0.05	$7,500.00	$375.00	$375.00			
		Fakai Tegako	12 (?)	0.05	$7,500.00	$375.00	$375.00			
		Teasagataupaka	19 (m)	0.06	$7,500.00	$450.00	$450.00			
		Saumalei	20 (t)	0.02	$7,500.00	$150.00	$150.00			
		Lofeagai	22 (a)	0.05	$7,500.00	$375.00	$375.00			
		Lofeagai	22 (ai)	0.03	$7,500.00	$225.00	$225.00			
		Latalua	23 (n)	0.04	$7,500.00	$300.00	$300.00			
		Matalagi	24 (o)	0.04	$7,500.00	$300.00	$300.00			
		Matalagi	24 (p)	0.14	$7,500.00	$1,050.00	$1,050.00			
		Matalagi	24 (u)	0.03	$7,500.00	$225.00	$225.00			
		Matalagi	24 (f)	0.04	$7,500.00	$300.00	$300.00			
		Teone	30 (u)	0.06	$7,500.00	$450.00	$450.00			
		Lotomua	33 (a)	0.07	$7,500.00	$525.00	$525.00			
		Tepule	55 (e)	0.04	$7,500.00	$300.00	$300.00			
		Tokotu		0.03	$7,500.00	$225.00	$225.00			
		Tokotu		0.01	$7,500.00	$75.00	$75.00			
		Sapalau	125(i)	0.05	$7,500.00	$375.00	$375.00			
		Tokotu	102 (e)	0.04	$7,500.00	$300.00	$300.00			
		Vao	87 (ng)	0.03	$7,500.00	$225.00	$225.00			
		Matafele	84 (a)	0.05	$7,500.00	$375.00	$375.00			
		Lotomua	33(?)	0.03	$7,500.00	$225.00	$225.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
32	Niu A	Laumanifi	136 (ao)	0.05	$7,500.00	$375.00		$1,950.00		
		Toli	137 (am)	0.04	$7,500.00	$300.00				
		Teatuafulufulu	18 (o)	0.06	$7,500.00	$450.00				
		Sapii	46 (ng) ?	0.04	$7,500.00	$300.00				
		Tealapae	26(ng) ?	0.07	$7,500.00	$525.00				
	Tolue Niu (Niu)						$426.56		Tolue Niu (Niu)	$426.56
	Stanley Manao (Vasati)						$426.56		Stanley Manao (Vasati)	$426.56
	Olapa Maluga (Tine)						$426.56		Olapa Maluga (Tine)	$426.56
	Aisake Epati (Sulusani)						$426.56		Aisake Epati (Sulusani)	$426.56
	Nomani Iese (12.5%)						$243.75		Nomani Iese (12.5%)	$243.76
33	Viliamu Liveti (Katalaina)	Tefou	8 (a)	0.06	$7,500.00	$450.00	$450.00	$675.00		$675.00
		Tepapa	134 (k)	0.03	$7,500.00	$225.00	$225.00			
34	Laisini Papamau	Lofeagai	22 (ng)	0.02	$7,500.00	$150.00	$150.00	$150.00		$150.00
35	Penileta S Pele	Tegaoa	140 (l)	0.04	$7,500.00	$300.00	$300.00	$1,125.00		$1,125.00
		Laugaisave	142 (e)	0.02	$7,500.00	$150.00	$150.00			
		Matafenua Tevakatoetoe	143 (v)	0.09	$7,500.00	$675.00	$675.00			
36	Iosia Apelu(Pelise Siavau)	Folokolupe	9 (n) ?	0.04	$7,500.00	$300.00	$300.00	$300.00		$300.00
37	Peniata Tui SM Court	Tokotu	102(e)	0.03	$7,500.00	$225.00	$225.00	$1,050.00		$1,050.00
		Matafele	84 (i) ?	0.02	$7,500.00	$150.00	$150.00			
		Saumalei	20 (m) ?	0.02	$7,500.00	$150.00	$150.00			
		Akimoa	27 (ng)	0.07	$7,500.00	$525.00	$525.00			
38	Penipelite (Pulafagu)	Vailaloniu	90 (i)	0.04	$7,500.00	$300.00	$300.00	$300.00		$300.00
39	Susie Motufoua (Telekia) (LC#: 16/2013)	Matalagi	24 (e)	0.03	$7,500.00	$225.00	$225.00	$600.00		$600.00
		Teone	30 (e)	0.05	$7,500.00	$375.00	$375.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
40	Tumua Latasi (Pepetua) LC#: 15/2015	Makini	29 (e)	0.08	$7,500.00	$600.00	$600.00	$1,425.00		$1,425.00
		Latalua	23 (n) ?	0.06	$7,500.00	$450.00	$450.00			
		Laugaisave	142 (u)	0.05	$7,500.00	$375.00	$375.00			
41	Lopati Iakopo (Pole)	Niua	80 ( )	0.04	$7,500.00	$300.00	$300.00	$300.00		$300.00
42	Pua Naseli	Tegaoa	140 (ang)	0.06	$7,500.00	$450.00	$450.00	$450.00		$450.00
43	Leupena Maimoaga	Folokovao	6 (ai)	0.04	$7,500.00	$300.00	$300.00	$3,525.00		$3,525.00
	LC#: 16/2015	Sumi	7 (u)	0.02	$7,500.00	$150.00	$150.00			
		Sumi	7 ( )	0.02	$7,500.00	$150.00	$150.00			
		Teasagataupaka	19 (f)	0.09	$7,500.00	$675.00	$675.00			
		Saumalei	20 (s) ?	0.02	$7,500.00	$150.00	$150.00			
		Latalua	23 (v)	0.05	$7,500.00	$375.00	$375.00			
		Matalagi	24 (k)	0.03	$7,500.00	$225.00	$225.00			
		Matautu	81 (ng)	0.03	$7,500.00	$225.00	$225.00			
		Luapou	45 (u) ?	0.02	$7,500.00	$150.00	$150.00			
		Teavaamagoo	31 (e)	0.06	$7,500.00	$450.00	$450.00			
		Tepapa	134 (p)	0.02	$7,500.00	$150.00	$150.00			
		Toli	137 (i)	0.02	$7,500.00	$150.00	$150.00			
		Toli	137 (o)	0.05	$7,500.00	$375.00	$375.00			
44	Polau K (Salome)	Sumi	7 (m)	0.05	$7,500.00	$375.00	$375.00	$600.00		$600.00
		Tegaoa	140 (o)	0.03	$7,500.00	$225.00	$225.00			
45	Samia S	Tugafale i Tegako	13 (a)	0.03	$7,500.00	$225.00	$225.00	$675.00		$675.00
		Kaiga i Tegako	15 (a)	0.02	$7,500.00	$150.00	$150.00			
		Vaotai	87 (aa)	0.04	$7,500.00	$300.00	$300.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
46	Seanoa S	Tepapa	134 (au)	0.01	$7,500.00	$75.00	$75.00	$2,100.00		$2,100.00
		Tepapa	134 (af)	0.02	$7,500.00	$150.00	$150.00			
		Laumanifi	136 (f)	0.03	$7,500.00	$225.00	$225.00			
		Tealalafaga	16 (l)	0.02	$7,500.00	$150.00	$150.00			
		Lofeagai	22 (ao)	0.03	$7,500.00	$225.00	$225.00			
		Latalua	23 (l)	0.03	$7,500.00	$225.00	$225.00			
		Matalagi	24 (i)	0.04	$7,500.00	$300.00	$300.00			
		Nukuatea	25 (l)	0.04	$7,500.00	$300.00	$300.00			
		Tokotu	102(f)	0.03	$7,500.00	$225.00	$225.00			
		Vailele	86 (a)	0.03	$7,500.00	$225.00	$225.00			
47	Semeli A	Tepapa	134 (u)	0.03	$7,500.00	$225.00	$225.00	$675.00		$675.00
		Lofeagai	22 (a) ?	0.03	$7,500.00	$225.00	$225.00			
		Akimoa	27 (m) ?	0.03	$7,500.00	$225.00	$225.00			
48	Siaosi F	Folokovao	6 (aa)	0.06	$7,500.00	$450.00	$450.00	$3,675.00		$3,675.00
		Lofeagai	22 (s)	0.03	$7,500.00	$225.00	$225.00			
		Latalua	23 (ng)	0.03	$7,500.00	$225.00	$225.00			
		Makini	29 (a)	0.03	$7,500.00	$225.00	$225.00			
		Lotomua	33 ( ) ?	0.05	$7,500.00	$375.00	$375.00			
		Teasagatai	92 (u) ?	0.06	$7,500.00	$450.00	$450.00			
		Sapalau	?	0.07	$7,500.00	$525.00	$525.00			
		Tokotu	102 (a)	0.09	$7,500.00	$675.00	$675.00			
		Toli Tokelau	138 (a)	0.04	$7,500.00	$300.00	$300.00			
		Toli	137 (u)	0.03	$7,500.00	$225.00	$225.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
49	Osema (Peitala)	Tokotu	102(a)	0.11	$7,500.00	$825.00		$2,700.00		
	App. Case No. 10/04 (03/02/2012)	Tuganiu Tegako	14 (i) ?	0.02	$7,500.00	$150.00				
		Tepapa	134 (v)	0.04	$7,500.00	$300.00				
		Sumi	7 (p) ?	0.04	$7,500.00	$300.00				
		Tegaoa	140 (p)	0.05	$7,500.00	$375.00				
		Teasagataupaka	19 (l) ?	0.1	$7,500.00	$750.00				
	Siaosi Finiki (1/2)						$1,350.00		Siaosi Finiki (1/2)	$1,350.00
	Aifou Tafia (1/2)						$1,350.00		Aifou Tafia (1/2)	$1,350.00
50	Maiau Ielemia	Vailele	86 (ng)	0.04	$7,500.00	$300.00	$300.00	$300.00		$300.00
51	Suka T	Mulipatai	89 (a)	0.01	$7,500.00	$75.00		$532.50		
		Matalagi Tevaka	24 (m)	0.04	$7,500.00	$300.00				
	App Case No: 18/2011	Matafenua Tevakatoetoe	143 (p)	0.02	$7,500.00	$150.00				
	Shared amongst:	Tugafale	83 (e) ?	0.001	$7,500.00	$7.50				
	Suka T 3/7						$228.21		Suka T 3/7	$228.21
	Siketi T 2/7						$152.14		Siketi T 2/7	$152.15
	Litia Leo 1/7						$76.07		Litia Leo 1/7	$76.07
	Motuomanu 1/7						$76.07		Motuomanu 1/7	$76.07
52	Manipola (Lauina)	Laugaisave	142 (a)	0.04	$7,500.00	$300.00	$300.00	$300.00		$300.00
53	Sulufaiga I	Lofeagai	22 (r)	0.03	$7,500.00	$225.00	$225.00	$750.00		$750.00
		Teone	30 (ng)	0.04	$7,500.00	$300.00	$300.00			
		Vailele	86 (f)	0.03	$7,500.00	$225.00	$225.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
54	Tagivasa	Tepapa	134 (s)	0.03	$7,500.00	$225.00	$225.00	$3,975.00		$3,975.00
		Toli	137 (g)	0.07	$7,500.00	$525.00	$525.00			
		Tegaoa	140 (u)	0.05	$7,500.00	$375.00	$375.00			
		Matafenua Tevakatoetoe	143 (u)	0.03	$7,500.00	$225.00	$225.00			
		Folokolupe	9 (m)	0.03	$7,500.00	$225.00	$225.00			
		Lulupuaka i Tegako	10 (a)	0.03	$7,500.00	$225.00	$225.00			
		Saumalei	20 (a)	0.04	$7,500.00	$300.00	$300.00			
		Saumalei	20 (e)	0.02	$7,500.00	$150.00	$150.00			
		Latalua	23 (u)	0.05	$7,500.00	$375.00	$375.00			
		Matalagi	24 (ae)	0.07	$7,500.00	$525.00	$525.00			
		Nukuatea	25 (e)	0.05	$7,500.00	$375.00	$375.00			
		Matafele	84 (u)	0.02	$7,500.00	$150.00	$150.00			
		Nauti Primary School		0.04	$7,500.00	$300.00	$300.00			
55	Tagoi & Olepa (Lipaa)	Tokotu	103(e/2)	0.03	$7,500.00	$225.00	$225.00	$225.00		$225.00
56	Malia Kilifi	Toli	137 (t)	0.04	$7,500.00	$300.00	$300.00	$1,125.00		$1,125.00
		Laugaisave	142 (p)	0.02	$7,500.00	$150.00	$150.00			
		Folokovao	6 (a)	0.05	$7,500.00	$375.00	$375.00			
		Tealapae	26 (m) ?	0.04	$7,500.00	$300.00	$300.00			
57	Tauese T	Folokovao	6 (ao)	0.07	$7,500.00	$525.00	$525.00	$5,250.00		$5,250.00
		Folokolupe	9 (p)	0.06	$7,500.00	$450.00	$450.00			
		Pukeuu	17 (ng) ?	0.03	$7,500.00	$225.00	$225.00			
		Teasagataupaka	19 (i)	0.15	$7,500.00	$1,125.00	$1,125.00			
		Teasagataupaka	19 (u)	0.08	$7,500.00	$600.00	$600.00			
		Nukuatea	25 (u)	0.08	$7,500.00	$600.00	$600.00			
		Nanumasa	34 (f)	0.07	$7,500.00	$525.00	$525.00			
		Tokotu	102 (u)	0.04	$7,500.00	$300.00	$300.00			
		Kaugutu Malae	75 (a)	0.03	$7,500.00	$225.00	$225.00			
		Tepapa	134 (c)	0.01	$7,500.00	$75.00	$75.00			
		Toli	137 (l)	0.04	$7,500.00	$300.00	$300.00			
		Tegaoa	140 (a)	0.04	$7,500.00	$300.00	$300.00			
58	Taufua F	Folokolupe	9 (u)	0.03	$7,500.00	$225.00	$225.00	$1,725.00		$1,725.00
		Tealapae	26 (s)	0.06	$7,500.00	$450.00	$450.00			
		Tepule	55 (o)	0.03	$7,500.00	$225.00	$225.00			
		Teasigatai	92 (e)	0.05	$7,500.00	$375.00	$375.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
		Kaugutu Malae	75 (o)	0.02	$7,500.00	$150.00	$150.00			
		Tegaoa	140 (ng)	0.04	$7,500.00	$300.00	$300.00			
59	Sauniga Kaio	Folokovao	6 (au)	0.03	$7,500.00	$225.00		$675.00		
	Share with Afe	Lotomua	33 (m) ?	0.04	$7,500.00	$300.00				
	2/3:1/3	Sapii	46 (i)	0.02	$7,500.00	$150.00				
	Taula Kaio 2/3						$450.00		Taula Kaio 2/3	$450.00
	Afe 1/3						$225.00		Afe 1/3	$225.00
60	(Puava Lalua)Taulagi (LC#: 15/2013)	Tepapa	134 (r)	0.03	$7,500.00	$225.00	$225.00	$1,125.00		$1,125.00
		Tealapae	26 (a)	0.05	$7,500.00	$375.00	$375.00			
		Vailaloniu	90 (e) ?	0.04	$7,500.00	$300.00	$300.00			
		Sapalau	125(?)	0.03	$7,500.00	$225.00	$225.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022

$7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
61	Suka T	Tepapa	134 (l)	0.01	$7,500.00	$75.00		$3,300.00		
		Matafenua Tevakatoetoe	143 (l)	0.05	$7,500.00	$375.00				
		Tegako	11 (a)	0.03	$7,500.00	$225.00				
		Tealalafaga	16 (e)	0.03	$7,500.00	$225.00				
		Tealalafaga	16 (i)	0.03	$7,500.00	$225.00				
		Matalagi	24 (n)	0.06	$7,500.00	$450.00				
		Fakapaseke	32 (e)	0.04	$7,500.00	$300.00				
		Talamaiava	53 ( ) ?	0.04	$7,500.00	$300.00				
		Luapou	45 (f)	0.02	$7,500.00	$150.00				
		Nauti Primary School		0.03	$7,500.00	$225.00				
		Auala i Tokotu	102 (n)	0.05	$7,500.00	$375.00				
		Vao	87(v)	0.05	$7,500.00	$375.00				
	Suka T (Taupale)				$825.00					
	Suka T (Taupale)						$353.57		Suka T (Taupale)	$353.57
	Siketi T						$235.71		Siketi T	$235.71
	Litia Leo						$117.86		Litia Leo	$117.86
	Motuomanu						$117.86		Motuomanu	$117.86
	Noama	(Total*0.24363636363636 4) from Previous Calculation					$825.00		Noama	$825.00
	Keisi (Pualuku)						$825.00		Keisi (Pualuku)	$825.00
	Saini						$825.00		Saini	$825.00
	SM Court#: 02/09									

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
62	Apete Apelu (Teagai)	Teasagataupaka	19 (ng)	0.05	$7,500.00	$375.00	$375.00	$3,525.00		$-
		Lofeagai	22 (t)	0.05	$7,500.00	$375.00	$375.00			
		Teavaamagoo	31 (a)	0.07	$7,500.00	$525.00	$525.00			
		Lotomua	33 (i) ?	0.1	$7,500.00	$750.00	$750.00			
		Tokotu	?	0.04	$7,500.00	$300.00	$300.00			
		Tokotu	102 (o)	0.04	$7,500.00	$300.00	$300.00			
		Matafele	84 (l)	0.04	$7,500.00	$300.00	$300.00			
		Auala i Tokotu	102 (o)	0.02	$7,500.00	$150.00	$150.00			
		Toli	137 (n)	0.06	$7,500.00	$450.00	$450.00			
63	Teava S	Teavaamagoo	31 (n) ?	0.05	$7,500.00	$375.00	$375.00	$375.00		$375.00
64	Polau Kofe (Temukisa K)	Folokolupe	9 (f)	0.04	$7,500.00	$300.00	$300.00	$1,650.00		$1,650.00
		Fakapaseke	32 (i)	0.1	$7,500.00	$750.00	$750.00			
		Matautu	81 (l)	0.02	$7,500.00	$150.00	$150.00			
		Sapii	46 (s)	0.02	$7,500.00	$150.00	$150.00			
		Fakalofu	52 (a)	0.04	$7,500.00	$300.00	$300.00			
65	Sotia Kolone (Teuini N) (LC#: 02/2015)	Tepapa	134 (t)	0.03	$7,500.00	$225.00	$225.00	$1,575.00	Teuni Malosi (LCAP#:05/2021)	$1,575.00
		Saumalei	20 (s)	0.04	$7,500.00	$300.00	$300.00			
		Akimoa	27 (i)	0.08	$7,500.00	$600.00	$600.00			
		Nanumasa	34 (s)	0.03	$7,500.00	$225.00	$225.00			
		Tepule	55 (l) ?	0.01	$7,500.00	$75.00	$75.00			
		Luapou	45 (e)	0.02	$7,500.00	$150.00	$150.00			
66	Maiau Ielemia	Teone	30 (f)	0.04	$7,500.00	$300.00	$300.00	$300.00		$300.00

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
67	Andrew I	Toli	137 (p)	0.07	$7,500.00	$525.00	$525.00	$2,700.00		$2,700.00
		Laugaisave	142 ( )	0.07	$7,500.00	$525.00	$525.00			
		Saumalei	20 (l)	0.05	$7,500.00	$375.00	$375.00			
		Matalagi	24 (ai)	0.07	$7,500.00	$525.00	$525.00			
		Teone	30 (l)	0.04	$7,500.00	$300.00	$300.00			
		Tugafale	83 (u)	0.02	$7,500.00	$150.00	$150.00			
		Funuafou	47 (o)	0.04	$7,500.00	$300.00	$300.00			
68	Peni Teuati (Tili K)	Laumanifi	136 (v)	0.03	$7,500.00	$225.00	$225.00	$2,550.00		$2,550.00
		Tepapa	134 (ae)	0.01	$7,500.00	$75.00	$75.00			
		Laugaisave	142 (n)	0.02	$7,500.00	$150.00	$150.00			
		Laugaisave	142 (p)	0.04	$7,500.00	$300.00	$300.00			
		Pukeuu	17 (a)	0.04	$7,500.00	$300.00	$300.00			
		Matalagi	24 (au)	0.06	$7,500.00	$450.00	$450.00			
		Funafou	47 (o) ?	0.05	$7,500.00	$375.00	$375.00			
		Tepule	55 ( ) ?	0.06	$7,500.00	$450.00	$450.00			
		Sapalau	125(r)	0.03	$7,500.00	$225.00	$225.00			
69	Toaripi L (Tapania)	Toli	137 (m)	0.06	$7,500.00	$450.00	$450.00	$2,850.00		$2,850.00
		Folokolupe	9 (a)	0.05	$7,500.00	$375.00	$375.00			
		Lofeagai	22 (p)	0.04	$7,500.00	$300.00	$300.00			
		Tealapae	26 (e)	0.04	$7,500.00	$300.00	$300.00			
		Akimoa	27 (a)	0.06	$7,500.00	$450.00	$450.00			
		Akimoa	27 (e)	0.05	$7,500.00	$375.00	$375.00			
		Mulipatai	89 (i)	0.02	$7,500.00	$150.00	$150.00			
		Sapalau	?	0.04	$7,500.00	$300.00	$300.00			
		Tugafale	83 (o)	0.02	$7,500.00	$150.00	$150.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
70	Apinelu Tili (Elisala Kae) LC#:7/2018	Laugaisave	142 (k)	0.04	$7,500.00	$300.00	$300.00	$3,675.00		$3,675.00
		Folokovao	6 (ae) ?	0.07	$7,500.00	$525.00	$525.00			
		Tealalafaga	16 (o) ?	0.07	$7,500.00	$525.00	$525.00			
		Saumalei	20 (f) ?	0.05	$7,500.00	$375.00	$375.00			
		Teone	30 (i) ?	0.06	$7,500.00	$450.00	$450.00			
		Fakapaseke	32 (a)	0.04	$7,500.00	$300.00	$300.00			
		Luapou	45 (a)	0.03	$7,500.00	$225.00	$225.00			
		Sapii	46 (l)	0.04	$7,500.00	$300.00	$300.00			
		Tepule	55 (f) ?	0.04	$7,500.00	$300.00	$300.00			
		Auala i Tokotu	102 (m) ?	0.05	$7,500.00	$375.00	$375.00			
71	Unidentified Owners	Nauti Primary School	?	0.01	$7,500.00	$75.00	$75.00	$600.00		$-
		Toli	137 (a)	0.06	$7,500.00	$450.00	$450.00			
		Vailele	86 (i)	0.01	$7,500.00	$75.00	$75.00			
72	Toma L	Tepapa	134 ( )	0.05	$7,500.00	$375.00		$1,050.00		
		Sumi	7 (k)	0.03	$7,500.00	$225.00				
		Vailele	86 (m)	0.06	$7,500.00	$450.00				
	Shared amongst: (Case no. 17/10)									
	Toma Liveti (Liveti)						$350.00		Toma Liveti (Liveti)	$350.00
	Maleko Puta (Puta)						$350.00		Maleko Puta (Puta)	$350.00
	Luuni Salanoa (Loise)						$350.00		Luuni Salanoa (Loise)	$350.00
73	Tui Peniasi	Teatuafulufulu	18 (a) ?	0.05	$7,500.00	$375.00	$375.00	$825.00		$825.00
		Nukuatea	25 (f)	0.06	$7,500.00	$450.00	$450.00			
74	Valo I	Teavaamagoo	31 (s) ?	0.05	$7,500.00	$375.00	$375.00	$375.00		$-
75	Luisa Valoa Fakamua	Toli	137 (k)	0.06	$7,500.00	$450.00	$450.00	$1,125.00		$1,125.00
	(Valoa. Lutelu)	Tepule	55 (u) ?	0.01	$7,500.00	$75.00	$75.00			
		Kulutoga	49 (i)	0.08	$7,500.00	$600.00	$600.00			

FUNAFUTI ROAD PARCELS LEASE PAYMENTS

Sept 2021 - Sept 2022 $7,500.00

No	Landowner	Land_Name	Reg_No	Acreage	Rate	Rent	Distribution	Total Rent	Payee	Payment
76	Vete Sakaio	Tegaoa	140 (o)	0.06	$7,500.00	$450.00	$450.00	$450.00		$450.00
77	Naama F (Vii.M) (LC#: 13/2013)	Folokolupe	9 (e) ?	0.03	$7,500.00	$225.00	$225.00	$6,975.00		$6,975.00
		Tealalafaga	16 (f) ?	0.05	$7,500.00	$375.00	$375.00			
		Teatuafulufulu	18 (e)	0.04	$7,500.00	$300.00	$300.00			
		Saumalei	20 (i)	0.08	$7,500.00	$600.00	$600.00			
		Saumalei	20 ( )	0.02	$7,500.00	$150.00	$150.00			
		Lofeagai	22 (i)	0.03	$7,500.00	$225.00	$225.00			
		Latalua	23 (ai)	0.06	$7,500.00	$450.00	$450.00			
		Matalagi	24 (t)	0.04	$7,500.00	$300.00	$300.00			
		Tealapae	26 (o)	0.08	$7,500.00	$600.00	$600.00			
		Akimoa	27 (vf)	0.07	$7,500.00	$525.00	$525.00			
		Salamata	79 (n)	0.09	$7,500.00	$675.00	$675.00			
		Fakai i Fale	72 (i) ?	0.03	$7,500.00	$225.00	$225.00			
		Sapii	46 (e) ?	0.02	$7,500.00	$150.00	$150.00			
		Nauti Primary School	?	0.04	$7,500.00	$300.00	$300.00			
		Tegaoa	140 (i)	0.06	$7,500.00	$450.00	$450.00			
		Matafenua Tevakatoetoe	143 (e)	0.19	$7,500.00	$1,425.00	$1,425.00			
78	Mate S. (Vine S)	Sumi	7 (o)	0.05	$7,500.00	$375.00	$375.00	$3,300.00		$3,300.00
		Sumi	7 (v)	0.06	$7,500.00	$450.00	$450.00			
		Tealapae	26 (u)	0.05	$7,500.00	$375.00	$375.00			
		Tealapae	26 (k)	0.07	$7,500.00	$525.00	$525.00			
		Teone	30 ( )	0.05	$7,500.00	$375.00	$375.00			
		Lotomua	33 (k) ?	0.04	$7,500.00	$300.00	$300.00			
		Vailiki	80 (ng) ?	0.02	$7,500.00	$150.00	$150.00			
		Sapii	46 (n)	0.03	$7,500.00	$225.00	$225.00			
		Toli	137 (ao)	0.07	$7,500.00	$525.00	$525.00			
		Total		**18.916**	$7,500.00	**$141,870.00**		**$141,870.00**		**$137,370.00**
						$141,870.00	$141,870.00			

STAKEHOLDER/COMMUNITY FEEDBACK SESSIONS – PARTICIPANTS LISTINGS[39]

STAKEHOLDER FEED BACK AND CONSULTATION PARTICIPANTS – 23 SEPTEMBER 2022

No.	Name	Gender (M/F)	Organisation	Contact
1	[Redacted]	M	Fusialofa Association	[Redacted]
2	[Redacted]	F	Fusialofa Association	[Redacted]
3	[Redacted]	F	Fusialofa Association	[Redacted]
4	[Redacted]	F	Fakaifou Women	[Redacted]
5	[Redacted]	F	Fusialofa Association	[Redacted]
6	[Redacted]	F	Women	[Redacted]
7	[Redacted]	F	Youth	[Redacted]
8	[Redacted]	F	Youth	[Redacted]
9	[Redacted]	F	Women	[Redacted]
10	[Redacted]	F	Fusialofa Association	[Redacted]

STAKEHOLDER FEED BACK AND CONSULTATION PARTICIPANTS – 26 SEPTEMBER 2022

No.	Name	Gender (M/F)	Organisation	Contact
1	[Redacted]	M	Vaitupu Island	[Redacted]
2	[Redacted]	M	Falekaupule Funafuti	[Redacted]
3	[Redacted]	M	Falekaupule Funafuti	[Redacted]
4	[Redacted]	M	Falekaupule Funafuti	[Redacted]
5	[Redacted]	F	Falekaupule Funafuti	[Redacted]
6	[Redacted]	F	Falekaupule Funafuti	[Redacted]
7	[Redacted]	F	Falekaupule Funafuti	[Redacted]
8	[Redacted]	M	Assembly of God Church	[Redacted]
9	[Redacted]	M	Nui Island	[Redacted]
10	[Redacted]	M	Falekaupule Funafuti	[Redacted]
11	[Redacted]	F	Falekaupule Funafuti	[Redacted]
12	[Redacted]	M	Kaupule	[Redacted]
13	[Redacted]	M	Ekalesia Kelisiano Tuvalu (EKT) Vaiaku	[Redacted]
14	[Redacted]	M	Nukufetau Island	[Redacted]
15	[Redacted]	M	Nanumaga Island	[Redacted]
16	[Redacted]	M	Falekaupule Funafuti	[Redacted]
17	[Redacted]	M	Tuvalu Association of Non-Governmental Organizations (TANGO)	[Redacted]
18	[Redacted]	M	Tuvalu National Private Sector Organisation	[Redacted]
19	[Redacted]	F	Falekaupule Funafuti	[Redacted]
20	[Redacted]	F	Tuvalu National Council for Women	[Redacted]
21	[Redacted]	F	Falekaupule Funafuti	[Redacted]
22	[Redacted]	F	EKT Funafuti	[Redacted]
23	[Redacted]	F	Tuvalu Family Health Association (TUFHA)	[Redacted]
24	[Redacted]	F	TUFHA	[Redacted]
25	[Redacted]	F	Falekaupule Funafuti	[Redacted]

[39] Information to describe events rather than include names and photos will be included as standard redaction process.

No.	Name	Gender (M/F)	Organisation	Contact
26	[Redacted]	M	Kavatoetoe	[Redacted]
27	[Redacted]	M	Falekaupule Funafuti	[Redacted]
28	[Redacted]	M	Nanumea Island	[Redacted]
29	[Redacted]	M	Falekaupule Funafuti	[Redacted]
30	[Redacted]	M	Falekaupule Funafuti	[Redacted]
31	[Redacted]	M	Falekaupule Funafuti	[Redacted]
32	[Redacted]	M	Falekaupule Funafuti	[Redacted]
33	[Redacted]	M	Falekaupule Funafuti	[Redacted]
34	[Redacted]	M	Kaupule	[Redacted]
35	[Redacted]	F	EKT Funafuti	[Redacted]