Tuvalu

Telecommunications & ICT Development Project

Environmental and Social Management Plan

Tuvalu Telecommunications and ICT Development Project (TvICT)

Environmental and Social Management Plan

Quality Information

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Date:	25 October 2023
Original Prepared by:	Kate Walker, PEECS
Restructuring Revisions by:	Sarah Hendrikx, Environmental Specialist

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Acronyms and Abbreviations

AP	Affected Persons
AU$	Australian Dollars
BMH	Beach Man Hole
CLS	Cable Landing Site
CPMO	Central Project Management Office
CS	Cable Station
DoE	Department of Environment
DWM	Department of Waste Management
EEZ	Exclusive Economic Zone
ESMP	Environmental and Social Management Plan
FAT	Fiber access terminal.
FTTH	Fiber to the home
GBV	Gender Based Violence
GoTv	Government of Tuvalu
GPON	Gigabit-capable passive optical network
GRM	Grievance Redress Mechanism
ICT	Information Communication Technology
ICTD	Information Communication Technology Department
LP	Landing Point
MCT	Ministry of Communication and Transport
MHARD	Ministry of Home Affairs and Rural Development
MJCFA	Ministry of Justice, Communications and Foreign Affairs
MoF	Ministry of Finance
NCD	Non-Communicable Diseases
NDP	National Development Plan
NGO	Non-Governmental Organisation
ODT	Optical distribution frame
O&M	Operation and Maintenance
OHS	Operational Health and Safety
PCR	Physical Cultural Resources
PEAR	Preliminary Environmental Assessment Report
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
PSTN	Public switched telephone network
RESA	Runway End Safety Area
SECP	Stakeholder Engagement and Consultation Plan
SPREP	Secretariat of Pacific Regional Environmental Program
SWMP	Solid Waste Management Plan
TA	Technical Assistance
TANGO	Tuvalu Association of NGOs
TEC	Tuvalu Electricity Corporation
TESDP	Tuvalu Energy Sustainable Development Project
TOR	Terms of Reference
TT	Task Team
TTC	Tuvalu Telecommunications Corporation

TvAIP	Tuvalu Aviation Investment Project
TvICT	Tuvalu Fibre Optic Cable Project
USP	University of South Pacific
WB	World Bank

Contents

Executive Summary

To facilitate the expansion and reform of Information and Communication Technology (ICT) services in Tuvalu, the Government of Tuvalu (GoTv) are planning to invest in a submarine cable system to connect Funafuti atoll to the international optical fibre network with funding support from the World Bank (Tuvalu Telecommunications and ICT Development Project (TvICT)). The TvICT was approved in 2019 but has experienced implementation delays. At the request of GoTv, the Project was restructured in 2023 to extend the project by six months and include an expanded subcomponent 2B which will fund "quick wins" to strengthen Tuvalu Telecommunications Corporation (TTC) infrastructure, operations, and activities. This version of the ESMP (Version G) updates the original ESMP (Version D) for the Project restructuring confirmed in 2023.

The TvICT will provide the following key objectives:

a) ICT policy and legislation reform focusing on the enabling environment for service providers and institutional development of the Ministry of Justice, Communications and Foreign Affairs (MJCFA), formerly called the Ministry of Communications and Transport (MCT), to enable them to develop policy skills for future application.
b) ICT sector review and reform to attract international ICT providers and to be able to sustain those investments. It is proposed to restructure TTC to allow for private (international) participation in the market.
c) Install a fibre optic cable to provide high capacity and lowest cost international connectivity to Funafuti. The preferred option for the cable connection will be from Tokelau (connecting to the Southern Cross NEXT cable on the ocean floor between the islands of Tokelau) to Funafuti. The basic infrastructure components will include:
    i) Approximately 985km of fibre optic cable laid on or beneath the sea floor.
    ii) A beach manhole landing facility and cable landing station at Funafuti to allow connection of the cable to the main telecommunications network.
d) In addition to the fibre optic cable into Funafuti, the project will also develop an infrastructure and connectivity strategy with implementation scope. This strategy may include use of the existing or additional investment in satellite sub-distribution from the Funafuti cable to provide improved ICT connection to the outer islands. This may be through maintenance or improvements of infrastructure on each island.
e) Minor works such as cable pulling in existing ducts for laying fiber cable network, small towers for mobile radio, and power supply upgrades for the network (the "quick wins").

The final route and landing location of the fibre optic cable is likely to be connected to the Southern Cross (SX) NEXT cable at a branching unit (BU) about 50km off Atafu, Tokelau. From there, the cable would be laid to Funafuti where it would need to land at a location that is reasonably accessible to the existing TTC cable ducts that are laid beneath the roads of Funafuti. A final landing point for the cable has yet to be determined and will be guided, in part by this ESMP. The landing site could be on either the ocean or lagoon side of Funafuti. The potential locations are shown below and are discussed in detail in Section 2.3.2. The ESMP recommends that of the proposed locations, sites 2, 3, 5 (prison site, not old TTC site) and 6 are environmentally and socially suitable for landing the cable and installing a beach manhole (BMH).

At the selected landing site, it is expected that the cable will be run through existing or new conduit between the landing point (LP) and pulled through to the BMH. At this point, the cable will be connected to the cable landing station (CLS), via existing or new conduit, in preparation for commissioning.

The TvICT was assessed as Category B under WB environmental and social screening guidelines and, as such, this ESMP was produced to ensure the integration of environmental and social stewardship into the project as required by Tuvalu's relevant laws and regulations and the Environmental and Social Safeguards Policies of the WB. This ESMP provides the set of mitigations, monitoring, and institutional measures to be taken during the implementation and operation of the TvICT to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The ESMP also includes the actions needed to implement these measures. The 2023 project restructuring is not expected to increase the environmental and social risk classification of the Project.

The key potential impacts that are being mitigated include:

- Solid waste management
- Aggregate sourcing
- Laydown site management
- Traffic disruption and transportation of materials
- Foreshore and landscape degradation
- Protection of important marine habitats
- Occupational health and safety impacts

The following table highlights the key protective measures that will be required during the Projects construction phases to ensure that all environmental and social impacts are avoided or reduced.

Parameters	Mitigation Measures
Construction Period	
Physical and Ecological Environment	
Hydrothermal Vents	As per contract specifications, lay cable along identified surveyed alignment. Maintain the specified 1km clearance from any identified active hydrothermal vents.
Sea Mounts	As per contract specifications, lay cable along identified surveyed alignment. Maintain the specified 2km clearance from base of any identified seamounts

Parameters	Mitigation Measures
Coral Communities	Contractor to adhere to surveyed cable route and give 75m clearance to any coral outcrops or reefs.
Air Quality	Vessels meet USEPA specifications for emissions to air.
Landscape degradation	• Limit foreshore work site to smallest workable area. • Clearance of any foreshore vegetation will be by hand and vegetation will be set aside for later restoration. • Once works are completed the foreshore will be returned to pre-project condition or better. • Foreshore vegetation will be reinstated on completion of works. • All excess materials will be removed from foreshore and trenching route to BMH.
Ground water pollution	• Concrete will be prepared on bunded and covered hard stand surface of laydown areas. • All waste water from concrete production will be collected and treated to lower the pH and allow particulates to settle out before being recycled for construction purposes. • Treated and tested waste water may be discharged for absorption into the ground. Discharge will be at a rate to allow absorption without causing surface flooding. • Slurry from concrete production will be collected and treated. Treatment can vary depending on viscosity of slurry but can include the same measures described for treating concrete waste water, or can be by facilitating the solidification of the slurry to form a gel which can be stored and disposed of according to the Solid Waste Management Plan. • Solid and cured concrete waste is considered safe to be reused by the community or the GoTv for infrastructure maintenance. • The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete waste water or slurry.
Laydown Site	• Laydown areas will be sited on government owned land. • Areas will be securely fenced. • Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery, the preparation of concrete and the prefabrication of solar arrays. • Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding • Stock piles of sand shall not be more than 2m high, shall be bunded at the base using sandbags or similar to prevent sediment laden run off and erosion of stock piled materials. • Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Worker inductions will include a tour of the laydown area and required practices from workers. • Spill response kits will be available and workers trained in their use.
Species of Interest – cetaceans	Control tension of cable during laying operations so that cable conforms to undulations of seabed as per cable laying specifications and/or provide anchors if needed
	Contractor to adhere to this ESMP which provides guidelines on minimally intrusive oceanographic survey methods (Annex B)
Socio-Economic Environment	
Coastal Resource Users – subsistence and artisanal fisheries	For lagoon side landing points, cable will be laid according to cable route which avoids coral outcrops or productive fishing grounds. Tuvalu Fisheries Department should be requested to advise local fishers of cable laying activities, dates, and avoidance measures.
	Request to Department of Marine and Port Services to update Funafuti Port marine chart with cable location and to declare no-anchoring zone along cable corridor

Parameters	Mitigation Measures
Coastal Shipping – commercial and shipping ports	• Ensure a shipping notice is issued, warning of cable-laying, dates, and safe clearance of vessels for other activities. • Request Marine and Port Departments() (In Tokelau and Tuvalu) to advise local shipping of laying activities, location (planned corridor) and avoidance measures
Influx of Workers	• The contractor will be responsible for ensuring that all local and foreign project staff attend training in the prevention of Gender Based Violence (GBV) and HIV/AIDS. Training courses have already been developed by the GoTv and will be facilitated for the Contractor by the Project Implementation Unit (PIU). • Project workers, project managers and the Contracting company are required to sign a code of conduct (in the bid documentation) after the training and prior to commencement of works. • Foreign workers are required to submit all required medical and police clearance certification as part of the Tuvalu visa application process. No person shall be exempt from this requirement.
Access	Provision of signage at appropriate coastal locations for local communities/fishermen to be advised of construction schedule and contact person in case of inquiries.
	Provision of electronic and print notices to nearby businesses, residences or facilities to notify of construction schedule and contact person in case of inquiries.
Occupational Health and Safety	• The main contractor(s) will be responsible for ensuring the safety of the local contractors engaged in the construction. • The contractor(s) should prepare a Health and Safety Plan (with appropriate emergency response procedures for remote locations and working at heights) and to provide provisions of personal protection equipment (PPE) to local contractors or local skilled laborers. • The main contractor shall hold regular meetings with local contractors and skilled labors on safety aspect topics.
Contractor Capacity	Conduct a one-day Contractor ESMP training workshop for Contractor and PIU as part of the kick-start process on contract award. Workshop to review ESMP implementation, mitigations, monitoring, and responsibilities.
Public Infrastructure	
Solid Waste	• All solid waste should be collected, handled and disposed of according to the Solid Waste Management Plan in Annex A of this ESMP and a Solid Waste Management Plan will be developed by the Contractor(s) and submitted for approval by the PIU Safeguards Advisor. • Any hazardous waste will be exported under the guidance and facilitation of the Tuvalu Department of Waste Management • The contractor is obligated to dispose offshore of all project waste including solid waste and hazardous waste.
Traffic	• Haulage will be by existing roads only. • Where appropriate employ traffic control measures on the road to prevent traffic accidents. • The workers shall have the relevant training and safety equipment. • Speed controls shall be in place when passing through residential areas or past sensitive social receptors. • All vehicles will be well maintained and operated by experienced and licensed drivers. • Spill kits will be available on the vehicles and drivers will be trained in their use. • Any damage to road surface will be reported immediately to PIU.

As part of the requirements of Tuvalu law and World Bank policy, this revised version of the ESMP (Version G) is to be publicly redisclosed by the MJCFA as the agency responsible for project implementation. MJCFA will ensure the ESMP Executive Summary is translated into Tuvaluan prior to disclosure in hard copy and online, in a manner that can be easily downloaded with existing network bandwidth and the accessibility that people currently have to the internet. A public flyer and/or radio advert will alert the public to the disclosure of the instruments. Likewise, MJCFA will ensure that several copies of all prepared safeguard instruments are available locally at the ICT office and easily accessible to affected groups and local Non-Governmental Organisations (NGOs).

1 Introduction

As in 2018 when the Project was designed, Tuvalu continues to be one of the least connected countries in the Pacific region today and is entirely dependent on satellites for international connectivity. Information Communication Technology (ICT) services are costly, of limited variety, and variable quality. Services are particularly limited outside the main island of Funafuti. This situation limits communications between households, in particular with overseas relatives, and also increases the cost of doing business and delivery of services. Beyond the personal level, the lack of ICT services constrains business development, tourism, and management of natural disasters. It is particularly a constraint on social services such as education, and healthcare; the lack of air transport to any of the outer islands makes first action medical care and advice from remote specialists very important but presently unavailable. In this context, this ICT Project proposes to support Tuvalu in developing the enabling environment for improved telecommunications/ICT service provision, restructuring the market, and implementing a sustainable solution for international/regional connectivity.

The Government of Tuvalu (GoTv) appreciates the need for ICT services extension and its third National Development Plan (NDP) notes the key role of ICT services as an underpinning enabler for development in other areas of GoTv priority such as education, health, and disaster management. Without the widespread availability of these presumed ICT services at workable prices, the other areas of Government priority cannot proceed.

Implementation of these wide-ranging reforms and improvements are necessarily tied to and dependent on the availability of high capability telecommunications across the whole country at prices affordable to the population. These societal and telecom reforms are aimed at:

a) Promoting socio-economic development of Tuvalu, in particular, to make available the widest possible range of efficient, reliable and affordable telecommunications and information services to all the islands of Tuvalu, and;
b) Creating a modern enabling environment making Tuvalu more efficient and more attractive to investment.

Successful reforms in this sector will likely contribute to the overall economic reform process in Tuvalu. A sound and efficient telecom and ICT sector is recognized as a necessary precursor to any sustainable and effective national development and prospective international interest in investment in the Tuvalu economy. Accordingly, ICT services expansion and widespread availability are key priorities for GoTv.

To facilitate the ICT services expansion, the GoTv are planning to design and implement a Public Private Partnership (PPP) to invest in a submarine cable system to connect Funafuti atoll to the international optical fibre network, with funding support from the World Bank (WB). The preferred option is to connect to the proposed Southern Cross NEXT project at Nukunonu, Tokelau, and this will be confirmed during project implementation.

The TvICT Project is structured to provide three key objectives:

a) Policy and legislation reform and development;
b) ICT sector review; and,
c) Infrastructure investment to establish high capacity and lowest cost international connectivity to Funafuti.

The first task for the above mentioned infrastructure investments is for a set of technical feasibility studies to be completed on the preferred cable route and landing infrastructure[1]. Following completion of these reports, the main construction phase activities during Project implementation under subcomponent 2a will be: a detailed marine survey, detailed design of the submerged infrastructure, construction of a landing facility and cable landing station at Funafuti, cable laying and terrestrial works[2]. The exact cable route and landing site in Funafuti will be informed by this Environmental and Social Management Plan (ESMP) and will be finalised during project implementation.

ESMP Version: The original version of the ESMP (Version D) was prepared in 2018 during the preparation of the Project. This version (Version G) updates the document for the Project restructuring that was confirmed in 2023. The Project restructuring was requested by GoTv to address implementation delays. It extends the project by six months and includes an expanded subcomponent 2B which will fund local infrastructure involving minor works such as cable pulling in existing ducts for laying fiber cable network, small towers for mobile radio, and power supply upgrades for the network and Wi-Fi access points in outer islands ("quick wins") to be funded from the existing funding envelope. It is anticipated that this restructuring will be the first of two restructurings. Further detail about the restructured Project is provided in Section 2.1.

1.1 ESMP Purpose and Scope

Initial project screening based on field investigations, stakeholder meetings and desktops study of similar projects in the region as well as a review of potential options confirms an assessment of Category B for the Project. It finds that potential impacts are less than significant, site specific, mostly reversible and that a range of potential measures for mitigation can be readily designed in the majority of cases. In accordance with WB safeguard policies, an environmental assessment is required to adequately screen and assess potential environmental and social impacts, and to prepare an ESMP.

Additionally, in accordance with WB safeguard policy regarding involuntary resettlement, a screening of the land required and the land ownership and lease arrangements is required to confirm that no involuntary land acquisition or resettlement will be required.

Therefore, this ESMP has been produced to ensure the integration of environmental and social stewardship into the project as required by Tuvalu's relevant laws and regulations and the Environmental and Social Safeguards Policies of the WB.

The ESMP provides the set of mitigations, monitoring, and institutional measures to be taken during the implementation and operation of the TvICT Project to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. The ESMP also includes the actions needed to implement these measures.

There are still some unknowns such as the cable route, landing sites, and building location, therefore this ESMP provides an assessment of the options to assist with the final selection process, and covers all foreseeable risks and impacts and provides the relevant suite of mitigation measures. If new project sites are proposed, this ESMP should be updated by a safeguard specialist to reflect the most current information prior to the release of any bid documents.

[1] Depending on the progress with the development of the PPP, these tasks under Component 1 are likely to be undertaken by the PMU in Ministry of Justice, Communications and Foreign Affairs (MJCFA).
[2] Depending on the progress with the development of the PPP, tasks under subcomponent 2a are likely to be undertaken by the PPP.

The original version of the ESMP (Version D) has been updated to reflect the restructured Project approved in 2023. The original version of the ESMP already included the requirement for environmental and social risk identification and management measures for small scale outer island works. However, the activities in the new subcomponent 2b were not covered in the original ESMP. Therefore, the ESMP (Version G) has been updated to cover the activities in the expanded subcomponent 2b (the "quick wins").

1.2 Integration of ESMP

It is the responsibility of the Project Implementation Unit (PIU) under the ICT Department (ICTD), to ensure that the ICT ESMP is fully integrated into the Project. The ESMP shall form part of any bid documentation, Terms of Reference (TOR) or partnership agreement for physical works, and it shall be the PIU's responsibility to ensure that ALL procurement documents, partnership agreements, and contractual specifications are subject to review against this ESMP and the January 2017 version of the WB standard procurement documents to ensure that all appropriate safeguard measures are captured at the bid stage and in all contracts.

It is further the responsibility of the PIU to ensure that this ESMP is considered in review of any TOR for Technical Assistance developed for the Project. The safeguard requirements for any design or supervision of the Project will be fully integrated into the TOR to ensure that all safeguard responsibilities allocated within the ESMP are realized at the tender stage.

In this way, the ESMP will be fully integrated within the Project so that the required measures will be fully appreciated by all responsible parties and successful implementation will be achieved.

1.3 Disclosure

As part of the requirements of Tuvalu law and WB policy, the ESMP is required to be publicly disclosed by the MCT, now called the MJCFA and their subsidiary agency Tuvalu Telecom Corporation (TTC), as the agency responsible for project implementation. MJCFA with the support of the Central Project Management Office (CPMO) have ensured the following disclosure and consultation has occurred on this ESMP including the grievance response mechanism in relation to this project:

- a brief summary of the ESMP is translated into Tuvaluan for disclosure in hard copy and online including via social media, in a manner that can be easily downloaded and/or accessed with existing network bandwidth and the accessibility that people currently have to the internet.
- A public flyer, television and/or radio advert has alerted the public to the disclosure of the instruments.
- The CPMO and MJCFA have conducted face-to-face consultations with Key stakeholders.
- Likewise, MJCFA and CPMO has ensured that several copies of all prepared safeguard instruments are available locally at the organisation offices and easily accessible to affected groups and local Non-Governmental Organisations (NGOs).

This version of the ESMP (Version G) has been reviewed and updated to reflect the project restructuring undertaken in 2023. The MJCFA with the CPMO have redisclosed the updated version of the ESMP (Version G). The ESMP will continue to be reviewed, updated, approved as necessary. For each approved updated version, the PIU will be continue to be responsible for disclosure through the above channels.

2 Project Description

2.1 Background and Context

As in 2018 when the Project was designed, Tuvalu continues to be one of the least connected countries in the Pacific region and it is entirely dependent on satellites for international connectivity. Telecommunications and internet services are costly, and services are particularly limited outside the main island of Funafuti. More affordable and reliable internet services would facilitate business development, tourism, and management of natural disasters, and support the delivery of social services such as education, and healthcare. This Project was originally intended to finance the Government's financial contribution to support the deployment of high-speed satellite capacity, and strengthen core TTC infrastructure, systems, corporate government and oversight, with technical assistance to support negotiations with international submarine cable providers.The largest part of this investment was intended to be in a submarine cable providing more affordable and higher capacity international bandwidth. New fixed and wireless access networks would provide affordable, high quality, end-to-end connectivity for Funafuti. The Outer Islands would also be covered by the services included under the PPP comprising improved satellite bandwidth and terrestrial access network infrastructure.

Not long after the project was approved in 2019, the Project encountered policy-related delays, which were compounded by border closures and other public health restrictions that were imposed from February 2020 until February 2023 due to the COVID-19 global pandemic. By the time restrictions had been lifted, it was clear that the original project design needed to be updated, including to take into account the post-COVID environment which is characterized by delays, component shortages, changed investment priorities, and higher costs. Through the Project, GoTv has retained international expert consultants to assist with updating investment and reform options to meet the original Project objectives, while leveraging current regional and global conditions. While the work on the medium-long term options is carried out, the Government also decided to finance the deployment of short-term "quick wins" to address the most pressing needs of TTC and allow for immediate improvements in telecommunications, making up for the time lost during the pandemic. On May 8, 2023, a restructuring request was formally submitted by the Government of Tuvalu and further clarified on June 6, 2023. It is anticipated that the 2023 restructuring is the first of two proposed restructurings for this Project.

This 2023 restructuring of the Tuvalu Telecommunications and ICT Development Project did the following: (i) revised the component descriptions to add a new subcomponent 2B to finance activities to strengthen TTC infrastructure, operations, and activities (the "quick wins"); (ii) changed the implementation arrangements to add TTC as a new implementing agency responsible for the implementation of the proposed new subcomponent 2B and confirm the role of the Central Program Management Office (CPMO) within the Ministry of Finance in supporting project management and implementation; (iii) revised the results framework to add three new intermediate results indicators to track implementation progress under the proposed new subcomponent 2B; (iv) revised the disbursement arrangements to permit withdrawals under the proposed new subcomponent 2B; and (v) extended the closing date by approximately 6 months from December 29, 2023 to June 30, 2024 to allow time for GoTv to complete the analysis and take a decision on which medium-long term option it wishes to pursue. The new subcomponent 2B "quick wins" will be financed from the existing funding envelope.

The Project will address the physical digital infrastructure and the enabling environment needed to support the implementation of digital infrastructure.

The Project components are as follows:

1. Component 1. Technical Assistance (US$2.00 million)
    a. Assist the Government to develop and implement ICT policy, new / amending legislation and reforms for the ICT sector;
    b. Assist the Government with: (idevelopment and implementation of the legal and regulatory enabling environment to support the implementation of the PPP and repositioning of TTC;
    c. Advise the Government on strategies to facilitate digital adoption, including a strategy for digital government and support for the development of the legal and regulatory enabling environment to support digital government and digital commerce (data protection, cybersecurity, cybercrime, e-transactions, etc.).
2. Component 2. Enhancing Digital Infrastructure (US$26.5 million). This component will finance support for the Government's financial contribution to support the deployment of high-speed satellite capacity, and strengthen core TTC infrastructure, systems, corporate government and oversight, with technical assistance to support negotiations with international submarine cable providers The outer islands would also be covered by the services included under the PPP comprising improved satellite bandwidth and terrestrial access network infrastructure. As explained in the Projects restructuring paper (2023), a new subcomponent 2B will finance the costs associated with strengthening the infrastructure, operations, and activities of TTC, including related technical assistance. The following new activities will be supported:
    a. fiber optic rollout on Funafuti to connect all Government offices, major users, telecommunications infrastructure and residential homes to fiber;
    b. local caching of content and internet domain names in Tuvalu to reduce the amount of data which needs to be supplied over satellite, improving the user experience and reducing costs;
    c. upgrading the power supply to the network on the outer islands needed to operate mobile sites and ancillary infrastructure;
    d. a hub for direct satellite connections between Funafuti and the outer islands for improved telephony and signaling;
    e. additional Wi-Fi access points on the outer islands to supplement broadband mobile services;
    f. small towers in Funafuti and on outer islands to support mobile radio; and
    g. gender initiatives around digital skills, digital literacy and cybersafety awareness, especially focusing on women entrepreneurship, and ICT skills and training for children.
3. Component 3. Project Management (US$0.50 million). This will finance Project administration, fiduciary support, Project audit and communications. This component will also support management of applicable safeguards compliance.

Environmental and Social (E&S) Safeguards. The Project is subject to safeguard policies, one of which applies: OP 4.01 (Environmental Assessment). The proposed restructuring is not expected to increase the environmental and social risk classification of the Project. The expanded subcomponent 2B will fund local infrastructure which involves minor works such as cable pulling in existing ducts for laying fiber cable network, small towers for mobile radio, and power supply upgrades for the network and Wi-Fi access points in outer islands.

The original ESMP (version D) already included the requirement for E&S risk identification and management measures for small scale outer island works. There are minor and manageable environmental and social risks associated with the fiber rollout including: (i) Occupational Health and Safety (OHS) for workers; and (ii) OHS risks associated with encountering unknown cables and services and working at heights (solar panels on roofs). No works will be financed on areas other than where Government has land tenure and access rights. Potential benefits include improved internet and

access to information, education, access to emergency services and livelihood; risks include exclusion or inequity for digital services; cybersecurity concerns; and cyber-bullying, addiction and exposure to illicit material. There are also potential risks relating to unequal access based on gender, age, ability, income and remoteness. These risks will be managed as part of stakeholder engagement activities under the Project, and review by WB staff of all outputs to ensure WB policy is adequately addressed. The implementing arrangements for the Project have been revised; however, CPMO will continue to provide on ground implementation support across the WB's portfolio, including for safeguards. The CPMO are adequately resourced with an international safeguard's consultant and one local staff to oversee safeguards aspects.

The PIU, with the support of the PIU Safeguards Advisor, will be responsible for overall safeguards oversight and implementation of safeguards for Component 1, the supervision of safeguards for any services they procure, and oversight of the Contractors and PPP Private Entity activities under subcomponent 2a. The PPP Private Entity will be responsible for safeguards implementation for any activities they deliver under subcomponent 2a (such as any technical assistance and physical works they will carry out) and will support the PIU on an ad hoc basis to supervise the Contractors. TTC will be responsible for implementing the ESMP for any activities that they deliver under sub component 2b and will also support the PIU Safeguards Advisor on an ad hoc basis to supervise the Contractors.

2.2 Current Conditions

Tuvalu's ICT sector is characterized by limited business, marketing and services delivery competencies, low international and national access capacity, very small size and at the retail end affordability and quality of services issues.

TTC is the GoTv owned sole service provider in the country, providing fixed and mobile voice, as well as fixed broadband, Wi-Fi hotspot and both 3G and 4G mobile internet.

All outer islands (except Niulakita – population 30) are served with fixed location services (i.e. customers must go to a dedicated location to use the service). Fixed voice services to individual premises are limited to two of the nine islands (Funafuti and Vaitupu). 4G mobile internet services (since April 2018) and 3G mobile voice services are limited to Funafuti. Four islands had 2G service of intermittent operation and low quality, but this was shut down in September 2016 pending future replacement with 3G. Wi-Fi internet access is available through fixed line broadband ethernet connections and also through internet hotspots.

Fixed lines: TTC provides fixed voice service through its copper network which reaches more than 44% of the households in the country and is present on all islands, with the majority of users in Funafuti. Though the network is quite extended, the copper network requires maintenance mainly in outer islands because of water damage and salty air. TTC plans to decommission the copper access network and use fixed wireless access delivered through mobile network and through satellite as an alternative.

Mobile: In 2014, mobile service was launched in Funafuti and in four of the outer islands. However, according to information from TTC, the deteriorating 2G GSM services has been decommissioned since 2015. 3G service was launched at the end of 2014 but only in Funafuti and in April 2018 TTC launched 4G in Funafuti and Vaitupu.

Broadband: Most broadband services are concentrated in Funafuti and provided through the copper network. Broadband access to the public is provided through Wi-Fi hotspots. In the outer islands, broadband connectivity for the public is only provided at TTC telecenters where customers connect through Ethernet wall sockets, although some islands are currently being equipped with Wi-Fi

hotspots. Government buildings, schools and health centres are connected by means of dedicated copper links. The bandwidth available for the outer islands (1.6Mbit/s in 2014) is shared equally among the users connected.

Fiber to the home (FTTH) / gigabit-capable passive optical network (GPON): The fixed broadband access has historically been based on the public switched telephone network (PSTN) copper lines using digital subscriber line (DSL) to provide Internet access. However, the copper line infrastructure is old, the quality has deteriorated to a level that only 50 DSL customer remain. The other users use mobile broadband as alternative but capacity remains extremely limited. The GoTv has started a small scale fiber optic connectivity project around the GoTv building just for GoTv use

2.3 Overview of the Fibre Optic Cable Component

The final route and landing location of the fibre optic cable is still to be determined. However, the preferred submarine cable route is shown in Figure 1 (in yellow). The cable is likely to be connected to the Southern Cross (SX) NEXT cable at a branching unit (BU) about 50km off Atafu, Tokelau. A 'fall back option', which is more expensive, would be for the cable to connect to the SX NEXT on Tokelau (using the existing BMH and cable station). Tokelau has contracted with SX NEXT on terms that would enable Tuvalu to connect to the cable at Tokelau and potentially secure access to the capacity on SX Next. The Tuvalu cable will be installed approximately 1 year after the Tokelau cable.

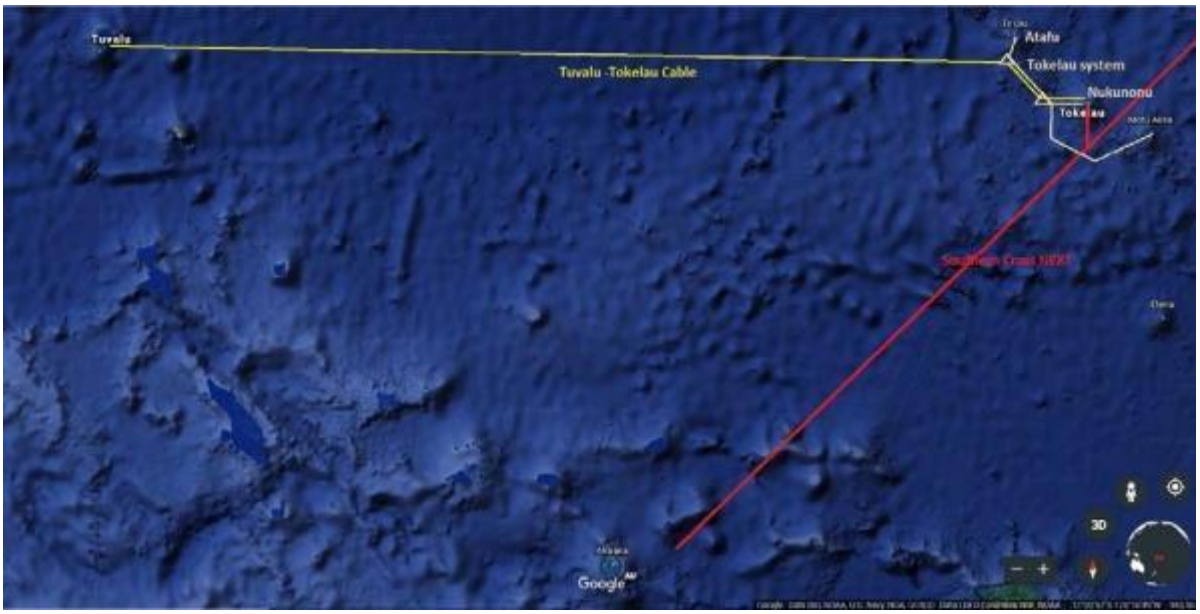

Figure 1: Preferred Fibre Optic cable route Nukunonu, Tokelau to Funafuti, Tuvalu

From there, the cable would be laid approximately 985km to Funafuti where it would need to land at a location that is reasonably accessible to the existing TTC cable ducts that are laid beneath the roads of Funafuti. A final landing point for the cable has yet to be determined and will be guided, in part by this ESMP. The landing site could be on either the ocean or lagoon side of Funafuti. The potential locations are shown below in Figure 2.

The defined route and location of the beach manhole (BMH) and cable landing station will be confirmed during project preparation and will be informed by this ESMP.

At the landing site, it is expected that the cable will be run through existing or new conduit between the landing point (LP) and pulled through to the BMH. At this point, the cable will be connected to the cable landing station (CLS), via existing or new conduit, in preparation for commissioning.

2.3.1 Cable Route and Project Site Description

The final planned cable route has yet to be determined in detail. A detailed marine survey to characterise the route and avoid hazards and/or environmentally significant zones will be carried out by the cable contractor during the project implementation phase. The survey will include water depth and seabed topography, sediment type and thickness, marine faunal/floras communities, and potential natural or human-made hazards. A marine route survey for a submarine cable system installation commonly assesses a seabed corridor from 1 to 10km wide with repeat passes where necessary.

Broadly speaking, the cable route starts on a slightly elevated ridge which runs between Atafu and Nukunonu, Tokelau. From there to Funafuti, the seafloor runs at a depth of over 6,500m[3] and is generally level with some scattered sea mounts. There are no significant trenches or ridges along the cable route. There is a moderate rise of the seafloor from its floor to about 2,000 m over 200-300km and from there a very steep rise to the reef crest over a distance of about 1,250 meters.

The LP has yet to be determined, however the potential options fall into two broad categories: oceanside landing and lagoon side landings.

2.3.2 Potential Landing Sites

The oceanside landings are characterised by a high energy wave regime exposed to the open ocean conditions, where breaking waves roll over the reef crest at all tidal ranges. The reef flat is generally between 150m to 200m wide and has an undulating surface with pools and ridges. The beach along the oceanside shore is formed from pebbles, rocks and small boulders. The lagoon side landing approaches the beach along a gradually rising mixed rocky and sandy seafloor with an average depth of 30-40m, then rising to meet the sandy beach. The lagoon side landing is sheltered from the wave conditions of the open ocean at all tides. The potential LPs are discussed along with any safeguards sensitivities below.

Several potential landing sites have been proposed for the landing of the cable (Figure 2) and, based on the technical requirements and the recommendations in this ESMP, the final landing site will be selected during project implementation. The landing sites are described here and their level of suitability for the project is determined. The following represents all practicable landing sites which have been identified and there will be no investigations or inclusion of other sites during project implementation.

[3] High Resolution Bathymetric Survey of Tuvalu. EU-SOPAC Project Report, 2008

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Figure 2: Proposed landing sites for Tuvalu Fibre Optic Cable

LANDING SITE 1

This landing site is within a residential area on the south west end of the runway on the ocean side and is privately owned. This residential area has been expanding over recent time and the clearing indicated in Figure 2 above is now the location of more buildings. Residential land is at a premium in Funafuti and the images below (Figure 3) show the development of Site 1 over time. As this area is a privately owned residential site in an expanding area, it is not considered suitable as a landing site for the TvICT project because it would be too restrictive on the ability for future residential land uses to be developed on the site.

Figure 3: Development of privately owned land proposed as landing site 1 to TvICT Project. Images show site in 2005 (left), 2016 (middle) and 2017 (right)

LANDING SITE 2

This site is on the ocean side of the atoll and is leased by the Government of Tuvalu. Currently, the land is used for agricultural/livestock purposes. Access from the landside to the coastline is via a well-established wide track (Figure 4) and a large concrete slab has been built just at the vegetation line (Figure 5). The site is host to a vegetable garden and a small well contained and managed piggery (Figure 4). This site would likely not be suitable for a Cable Landing Station as the land is already being well used, however it could be a good site for landing the cable and construction of BMH, with ducting and trenching being run to the cable landing station which would have to be located nearby, likely at the old TTC telecom station, the TEC compound or within the Air Tower Control compound nearby.

As with the other ocean side proposed landing sites, the beach is formed from rocks and stones and is scattered with large items of solid waste. The wave energy is high at all tidal ranges, the surface of the reef flat is devoid of any significant marine lift, with occasional scattered coral specimens which can survive in this type of environment. The reef flat is undulating and uneven with deeper pools along its length.

Figure 4: Connecting track from land side to coastline of proposed landing site 2 with vegetable garden on the right and well maintained piggeries on the left

Figure 5: Concrete slab at vegetation line on proposed landing site 2

Figure 6: Shoreline and high energy reef flat at proposed landing site 2 with evidence of solid waste on the beach either from dumping or washed in from the ocean.

LANDING SITE 3

The third proposed landing site is also on government leased land and is located at the north eastern end of the runway. This site has a number of sensitive receptors, environmentally, socially and safety, that must be considered and which make this proposed landing site unsuitable in the view of this ESMP.

Environmentally, the ocean side landing is again a high energy rocky shoreline with little marine life, however it is next to an environmentally sensitive brackish pond (Tafua Pond) and mangrove habitat (Figure 7). Tafua Pond is a 1.39 ha natural pond, rather than an old borrow bit, which is surrounded by a dense mangrove stand (*Rhizophora stylosa)* lining its shore which are up to 40m wide on the south eastern banks. Tafua Pond is the remains of a much larger low-lying area which was filled during the construction of the airstrip in 1942. On the landside, the pond is bordered by piggeries (Figure 8) and the quality of the water has greatly decreased due to the impact of the effluent that flows into it. This site has been proposed by the Funafuti Kaupule in cooperation with TANGO as a potential site for environmental restoration and milkfish (*Chanos chanos*) production.[4] The pond is on the edge of the AOI for landing site three and might be impacted from the trenching activities during the construction phase, however due to the degraded nature of the pond, any impact would likely be minor.

Figure 7: Tafua Pond immediately to the south east of proposed landing site 3 (red square).

Figure 8: Proximity of piggeries to the Tafua Pond.

[4] Tuvalu Technical & Country Mission Report – Assessment of Aggregate Supply, Pond and Lagoon Water Quality & Causeway Construction on Funafuti and Vaitupu Atolls. SOPAC, 2014.

Socially, the proposed site is home to many informal piggeries which would limit the landing site location to avoid any resettlement should the proposed landing site be situated close to the pond, rather than the runway end.

From an aviation safety perspective, the proposed site is at the end of the runway in an area of cleared of any trees and devoid of any buildings. This area is the runway end safety area (RESA) which is define as "the surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an overshoot, undershoot, or excursion from the runway. The current international standard (ICAO) requires a 90m RESA starting from the end of the runway strip. In the case of Funafuti, this takes the RESA almost up to the shoreline (Figure 9) and leaves little space for new buildings. The RESA does allow for sufficient space to construct a BMH at this site and from there the cable could be run to the CLS which can be more suitably located elsewhere.

Figure 9: Approximate boundary of Funafuti International Airport runway end safety area (RESA) for runway end 21

LANDING SITE 4

The area of proposed landing site 4 is on government leased land and is subject to new planning considerations from the Department of Lands to hand ownership over to the Funafuti Town Council. In addition to this, the land is already heavily developed and is the site of the new Nanumaga Community Hall on Funafuti (Figure 10). It is also the site of the Nanumaga EKT church on Funafuti (Figure 11).

The landing site itself is, again, a high energy rocky beach fronting an undulating reef flat which is devoid of significant marine life. The community hall and church at the back of the beach are protected by a low sea wall with access via a series of small steps (Figure 12). During the site visit, community members were observed fishing from the shore at this site (Figure 13).

This site is not considered to be suitable for landing the cable or housing the cable landing station due to important community buildings, lack of suitable space for a building, and the current uncertainty over its future ownership.

Figure 10: Nanumaga Island's community hall being built on the shoreline of proposed landing site 4

Figure 11: View of EKT church from the sea wall of propose landing site 4

Figure 12: Sea wall, rocky shoreline and high energy reef flat of proposed landing site 4

Figure 13: Community members fishing at the proposed landing site 4

LANDING SITE 5

The proposed landing site 5 is also the technically preferred site due to its lease status, proximity to ducting, location within the industrial area of Funafuti, and the availability of buildings for renovation to form the cable station.

Landing site 5 is on Government leased land and is the site of the former TTC satellite station, between the Tuvalu Electricity Corporation (TEC) and the prison (Figure 14). The site has fallen into a state of neglect and is not currently used by the government. A large number of informal piggeries have been constructed on the site, starting behind the old telecom station and stretching back to the coastline for the width of the site (Figure 15). These piggeries belong to several different farmers, are poorly maintained and have no drainage meaning that the site is contaminated by effluent from the sties (Figure 16) as close as 10m from the building. Access from the land side to the ocean is via a narrow path between pig sties.

The disused building appears to be in good structural condition and suitable for renovation into the cable landing station (Figure 17). However, its proximity to the piggeries mean that it is subject to the foul smell of the effluent and would not currently constitute a healthy working environment.

As with the other ocean side landing points, the beach is rocky and leads to a reef flat, of approximately 150m in length. The reef flat is, again, undulating and uneven but devoid of any significant marine life. The wave energy is high at all tide levels and the reef flat is underwater at low tide (Figure 18).

As the TvICT Project will not be undertaking any resettlement of piggeries or any other assets, this project would be unsuitable for landing the cable. In addition to this, as the access to the beach is along a narrow path between the piggeries, it is too narrow to allow for the cable landing construction works and would also make any future maintenance of the cable difficult if the piggeries without permanent resettlement. WB safeguard operating policies consider the informal piggeries to have rights to fair and just compensation or alternatives as the user of the resource (in this case land) in question. They are considered to be affected persons (AP) regardless of their legal rights to the resource and therefore they will not be subject to any resettlement or relocation and this site will not be used for cable landing.

Figure 14: Potential Landing Site 5 (yellow) with the Tuvalu prison (purple), public meeting hall (orange) and Tuvalu Electrical Corporation (TEC) power plan and offices (red). Approximate extent of informal piggeries at site 5 in hatched yellow.

Figure 15: Informal piggeries between the disused building and the coastline of proposed site 5

Figure 16: Areas of pig effluent are found across proposed landing site 5

Figure 17: Disused building at proposed landing site 5

Figure 18: Shoreline and reef flat of proposed landing site 5 during low tide

While a cable landing at this site is not suitable for the TvICT, the neighbouring prison compound has been assessed and found to be a potential alternative. The land is currently leased by GoTv and doesn't have any piggery or other resettlement issues. It is close to the old telecom station and would provide secure access for ongoing maintenance of the cable along its route to the BMH if necessary. The shoreline is as pictured in Figure 18 and its location is show above on Figure 14 (purple outline). The prison landing site is considered to be a variation of Landing Site 5.

Landing Site 6

This site is the only proposed landing site that falls within the Funafuti Lagoon for a lagoon side cable landing. Landing within the Funafuti Lagoon would entail a slightly longer cable route, by about 90km and would require longer sections of armouring of the cable compared to an ocean side landing. There are several suitable channel entrances for the placement of a submarine cable, with the closest option being the Te Ava Pua Pua channel (12-15m depth) on the south east edge of Funafuti Lagoon.

The Funafuti Lagoon itself has a sandy substrate with between 25 – 40m depth and scattered outcrops as indicated on the marine navigational chart. The approach to the proposed landing site 6 is gently sloping from 25m to the shore across a rocky intertidal zone habitat and a coarse sandy beach (Figure 19). The wave climate within the lagoon is generally calm and sheltered with chop and fetch experienced during storm or cyclone event.

This landing site leads directly to the operational TTC station (Figure 20) which is located at the back of the beach, although it is not clear at this stage whether there is sufficient space for a new cable landing station or spare capacity within the existing buildings to accommodate this facility.

The beach area itself is already impacted by development activity from a disused wharf at the landing site and large-scale land reclamation works which are taking place next to the landing site and

stockpiling aggregates at the back of the beach (Figure 21). The intertidal zone of the beach is devoid of any notable marine life (corals or macroalgae).

Small local fishing boats have set moorings near the potential landing site. These boats do not tend to anchor in the lagoon, preferring instead to moor the boats which decreases the likelihood of any anchor entanglement or damage to the cable close to the shore.

Figure 19: Rocky intertidal zone and coarse sandy beach of proposed landing site 6 at mid tide. Also shows in pre-existing wharf and evidence of development impacts on sandy beach.

Figure 20: Coarse sandy beach and vegetation line at proposed landing site 6. Behind the mast and trees, the current TTC station is visible.

Figure 21: Aerial view of potential landing site 6 within Funafuti Lagoon, directly opposite proposed landing site on the ocean side. The large scale reclamation works (red) and the current TTC station (yellow) are shown along with the potential cable approach route (arrow)

2.3.3 Terrestrial Infrastructure

A new BMH will be constructed at the landing site in Funafuti to house the cable. The final site for the BMH will depend on the final selected landing site, however it will be between 20-200m from the LP. The final design of the BMH has yet to be developed, however they are typically concrete, approximately 2m wide, 3m long, and buried to a depth of 2m. Access would usually be at ground level through an access hatch in the roof. The BMH will contain ducts through which the cable will pass from its seaward to landward side to the cable landing station. (Figure 22).

Independent of the BMH will be the CLS. There are several options for housing the unmanned CLS and it will likely be constructed on the old foundation of the TTC telecom station, within the compound of the TEC or within the compound of the air traffic control tower. All three sites are along the southern edge of the Funafuti runway and are government leased properties. It is not yet known whether the CLS will be a new construction or a rehabilitated existing building. The CLS will receive the cable via ducting from the BMH and will house the connection of the fibre optic cable.

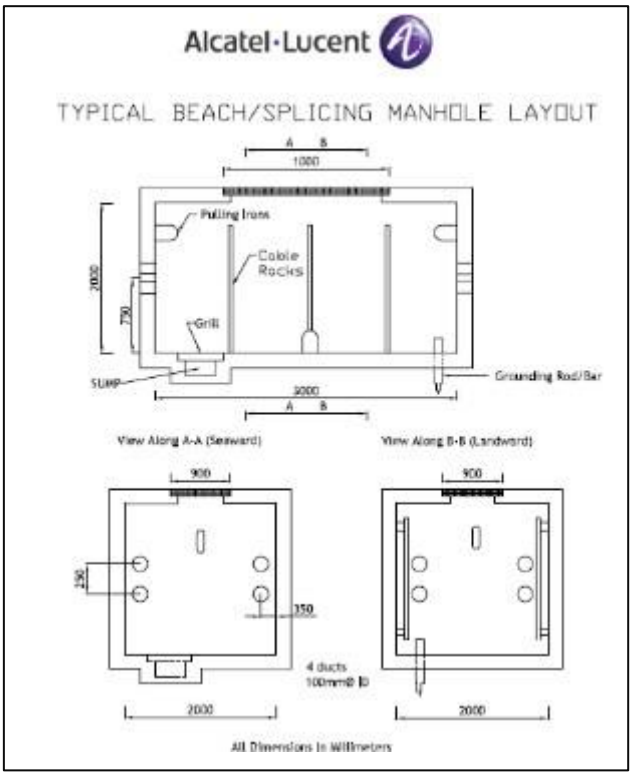

Figure 22: Typical Beach Man Hole design and layout

2.3.4 Cable Characteristics and Installation Method

At this stage of project preparation, it is expected that most of the cable will be unarmoured for its length along the seafloor and will transition to armoured cable in shallower waters where the cable may be exposed to risk of damage, or across reef crests and flats. It is also expected that the cable with have repeaters along its length from the BU at Tokelau to Funafuti. Figure 23 provides typical design specifications of these cable types.

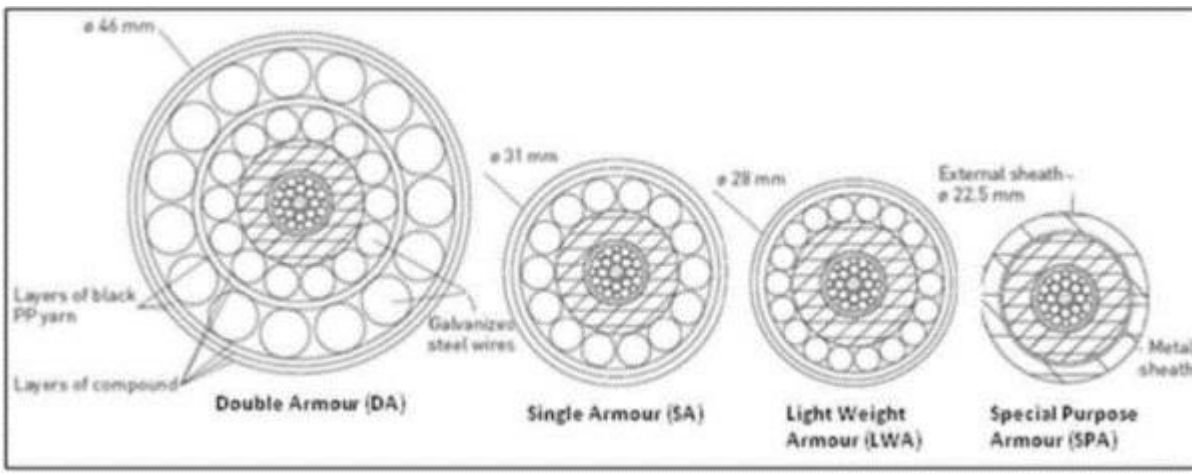

Figure 23: Typical design of fibre optic cable options

The cable has yet to be selected, however, submarine telecommunications cables that are in current production by many suppliers use polyethylene for insulation. This material is exceptionally stable and hydrophobic. It is typically used in the transportation of water for human consumption in construction and domestic installations. It has no components that leach. The armour wires typically used are in carbon steel with a zinc coating to 32minimize the corrosion of the steel. Minimal chemical dissolution of the zinc can be expected at a very slow rate when exposed to the sea. The outer layers of the cable

are designed to keep the galvanized wires protected from the seawater and consist of several layers of polypropylene yarn impregnated with bitumen. Polypropylene (like polyethylene) is a very common material used for the storage of potable water and similarly does not leach any material. The yarn is similar to that used in agricultural binding twine and some fishing netting.

It is possible to protect the cable in areas of vulnerability by encasing it with an articulated armouring (Figure 24). Articulated piping would serve to increase cable protection against damage caused by wave action or vessel damage and will be of particular importance where the cable cannot avoid routing over rock or coral in areas of heavy marine traffic. Armouring of the cable would be necessary in the high energy reef crest and reef flat of the ocean side landings or the shallow lagoon side landing where marine traffic increases the risk of damage.

Figure 24: Articulation on submarine cables. Pinning on hard substrate is shown

Cable Installation

The main lay will involve laying the cable along an as-yet-to-be-determined route using a special purpose cable ship. It is expected that the cable laying vessel will employ all of the latest technologies and equipment, including dynamic positioning systems that allows vessels to maintain accurate positions and therefore do not need to deploy anchors during installation operations.

Figure 25: Typical cable laying vessel

Figure 26: Example of a Branching Unit

Once connected to the branching unit at Tokelau, the cable will be laid by the main lay vessel. It is initially payed out slowly with the vessel moving slow ahead until the cable reaches the sea floor, at this point the vessel can increase its speed to about 6-8 knots. Occasional reductions of speed will be necessary to control the tension in the cable and ensure cable laying controlled. Most cable laying vessels cannot operate in waters less than 12-15m and will engage its dynamic positioning system while the shallow water and landward installations are completed. During this time the vessel will maintain an operating exclusion zone of 30m radius. To complete the shallow water lay the end of the cable will be passed to a smaller local landing craft which will then pull the cable ashore along the planned route (Figure 25).

Figure 27: Cable landing operations, Nuku'alofa, Tonga

Once at the LP, the cable will either be trenched (for lagoon side landings) or pinned to the reef flat and covered in concrete (for ocean side landings) to the back of the beach and then both ocean and lagoon landing sides would require the cable to be buried in a trench and ducting (if required) to the BMH.

2.3.5 Land Acquisition

The final LP has yet to be determined, however the site will on land leased by the Government of Tuvalu, or one of the GoTv public corporations such as Tuvalu Telecommunications Company (TTC). Private land may be leased if necessary, under the laws of Tuvalu. There will be no resettlement (involuntary or otherwise) of any persons or assets associated with the implementation of the TvICT Project.

2.3.6 Ancillary Works

It is expected that there will be ancillary works associated with the construction of the BMH and the construction/rehabilitation of the CS. The final scope of these works will be confirmed during the detailed design phase, but it is expected to include the following:

Aggregate Supply: Concrete will be required for the BMH and the foundations of any new CLS that is built. Exact designs and volumes are unknown at this stage, but sand materials will be needed by the Contractor to produce the concrete. The supply of aggregates in the Tuvalu is limited. The most common methods of aggregate extraction are shorefront quarrying which, given the limited natural resources in Tuvalu, is not an environmentally sustainable aggregate supply. The Public Works Department (PWD) and the Funafuti Kaupule should be consulted with during project implementation to investigate the possibility of using any stockpiles of sand they may have available. Should this stockpile not be available, any required aggregates will be imported for this project.

Laydown Site: A laydown site (or sites) will be required for the storage of equipment and staging of construction works for the BMH and CLS development. It is expected that the construction works associated with the installations will be relatively minor and limited to the preparation of concrete foundations, rehabilitation of existing buildings or construction of a new, prefabricated CS. The MJCFA is responsible for identifying government land to be used by the Contractor as temporary laydown areas.

Haulage Routes: As all materials, equipment and machinery will be imported to Tuvalu for these works, it can be expected that haulage routes will need to be defined for each project site for all components. All imported items will need to be transported from the main port to the Contractors laydown areas. At this stage, the volume of imported items and the locations of the laydown areas are considered to be low and unlikely to be a significant aspect of the project. It is expected that haulage trucks will be used to move all materials and equipment and that this will take place on the public road network.

Coastal Protection Works: minor works may be required at the BMH to protect from shoreline erosion.

2.4 Overview of Subcomponent 2b "Quick Wins"

2.4.1 Fiber to the home (FTTH) / gigabit-capable passive optical network (GPON) Rationale

Deployment of a FTTH/GPON network will utilize the existing conduits of the copper line infrastructure to connect all major institutions and business, as well as many residential users, to a very high capacity FTTH network. In combination with local caching of major content, this will enable high quality broadband experience for users for all content which can be cached locally (typically about 50% of the Internet traffic). Also, any local content (like Government to citizen) can be made accessible at very high speed.

2.4.2 FTTH/GPON Design

The overall topology consists of:

- A fully centralised Optical Line Terminal (OLT) at the TTC satellite hub station where the optical distribution frame (ODF) and the splitters are to be placed. Each customer will be connected to a "home run" fiber strand. There are no decentralised splitters in the initial design. The total number of Homes Passed is expected to be around 1,200. The central location is an existing TTC technical facility.
- From the central location, four 7-way ducts are planned. Each subduct will be utilized for a 96

core cable to a fiber access terminal (FAT) closer to the target customers. Two 7-way ducts will be single star topologies while two other 7-way ducts will form a ring via the key hospital location. These 7-way ducts will be installed in the existing conduits of the old copper line based telephone network. Only some clean-up of manholes and conduits might be required.

Figure 28: Example of manholes filled with sand (left) and relatively clean (right)

A total of 19 FATs (and 1 spare) is foreseen. In the FATs the 96 core cable are to be connected to four onward 24 core cables towards the end-users. These 24 core cables will pass through multiple access pits where the final drop wires are to be connected using a small splice box. The FATs will be installed in existing manholes of the old copper line based telephone network. Only some clean-up of manholes and conduits might be required. The subducts for the 24 core cables to the access pits (handholes) will reuse the existing conduits and existing handholes.

The drop wire to the home will be a small micro duct to be pushed in the existing conduit. The drop fiber is to be blown into that micro duct. Similarly the 24 and 96 core cables are anticipated to be blown into the specified ducts which will be pushed/pulled into the existing conduits. The conduits from the existing handholes to the homes are mostly existing conduits of the copper network. Local trenching on private land will only be required in exceptional cases where there is no existing conduit to the home and the owner wants to be connected. Priority is roll-out in all existing conduits.

Figure 29: Examples of smaller pit with drops (small conduits) directly to the homes

Figure 30: Maps of FAT locations and 7-way duct topology.

The Project will use composite monopoles to support mobile radio antennae. These are readily available at around 20 to 40 feet depending on the topology and use-case. Often the designs have been made for the 4G/5G small deployments in both urban and rural environments. Those composite poles can be installed without a large concrete foundation (typically they will have one section in the ground and no need for a concrete foundation). A lower simple tower is much easier to deploy cost-effectively in remote outer island locations than traditional steel towers. A picture of a similar deployment in Africa is attached for illustrative purposes (Figure 31). In the Pacific, any solar panels on the monopole would likely be mounted lower to reduce risks of being damaged by storms. Any solar panels that will be roof mounted will be fitted onto the roof of existing TTC buildings.

Figure 31: Example of a monopole

Other activities will involve software or the purchase of computers, which will be similar in size and operation to a standard desktop used in a home or office. These computers will be operated in the existing computer room(s) at TTC.

3 Policy, Legal and Administration Framework

3.1 National Legislation

3.1.1 Tuvalu Environment Protection Act 2008 and 2014 EIA Regulations (amended 2017)

The Act covers impact assessment, international and regional environmental obligations, biodiversity protection, climate change strategy and waste management.

Under Section 18, the Department of Environment (DoE) has the power to create regulations to provide for a system of environmental impact assessment to be applied in Tuvalu.

3.3.1.1 2014 EIA Regulations amended by the Environment Protection (Environment Impact Assessment) Amendment Regulations 2017

The TvICT Project is a Public Works Project with infrastructure development and foreshore burial works therefore, the 2014 EIA Regulations amended by the Environment Protection (Environment Impact Assessment) Amendment Regulations 2017 apply and will require a development consent issued by the Department of Environment. As part of the consent process, a Preliminary Environmental Assessment Report (PEAR) must be prepared by the proponent (TTC).

The process, as prescribed by the 2014 regulations (amended in 2017), is as follows:

6A – Process for environmental impact assessment

(1) The environmental impact assessment process shall be undertaken as follows:
   (a) notification of the proposed development activity by the proponent to the Department through completing and lodging the Notification and Application for Development Approval as required under sub-regulation 6(1)(a);
   (b) screening by the Department in accordance with regulation 6B;
   (c) scoping by the Department in accordance with regulation 6C;
   (d) submission of the development approval application by the proponent in accordance with sub-regulation 6D;
   (e) review of the development approval application either by the Department or an external agency or consultant in accordance with regulation 14A or regulation 15;
   (f) public consultations by the proponent as determined by the Minister under regulation 16;
   (g) referral of a full assessment by the Department to the Environmental Impact Assessment Task Force for consideration and recommendation in accordance with regulation 18;
   (h) decision making by the Minister based on the recommendation of the Environmental Impact Assessment Task Force;
   (i) monitoring of the development by the Department in accordance with regulations 14 and 23; and
   (j) enforcement by the Department of any conditions imposed with a development consent in accordance with regulation 23.

(2) The environmental impact assessment process must be completed within thirty (30) working days after receiving the development proposal.

6B – Screening

(1) The Department must screen any development proposal registered using the EIA Screening Checklist, issued by the Department, to identify potential environmental and social safeguard risks and impacts so as to determine which category to assess the proposed development activity under:
   (a) Category A – development activities that will result in broad, diverse and potentially irreversible adverse impacts, major resettlement, conversion of natural habitats and involves the use of hazardous materials;

(b) Category B – development activities that are geographically limited with readily identified adverse impacts that can be mitigated;
(c) Category C – development activities with negligible or minimal potential adverse impacts that are easily mitigated and are exempted under regulation 5.

(2) The screening must also determine the type of report required to be prepared for each category of development such as:
(a) full environmental impact assessment for category A; and
(b) preliminary assessment report for category B.

(3) The Department is to advise the proponent about the category and required report and request that an official development consent application be lodged.

(4) The Department must complete the screening process within two (2) working days after registration.

6C – Scoping

(1) The Department must undertake a scoping exercise where the screening process assesses a development activity either as a category A or B.

(2) In carrying out a scoping exercise, the Department must:
(a) identify the significant environmental and social impacts that the proposed development may cause and identify which of those impacts are likely to be extreme and therefore require detailed investigation;
(a) consult with the people who may be affected by the proposed development, either directly or indirectly; and
(b) consult with the people who may have special knowledge of the proposed development.

(3) The information collected under sub-regulation (2) shall inform the Terms of Reference which the proponent must develop in accordance with the EIA guidelines issued by the Department.

The scoping process must be completed within ten (10) working days.

The Department of Environment will approve the development consent, unless the Minister decides that, due to the potential risks of the project, a full Environmental Impact Assessment is required. As this ESMP contains options rather than the final selected project site, the PEAR will need to be further developed than this ESMP but can still call on its contents where relevant.

3.1.1.2 Schedule 1 of the Environment Protection Act 2008

Schedule 1 provides a list international conventions to which Tuvalu has signed. This includes:

- United Nations Framework Convention on Climate Change (Adopted at New York on 9 May 1992).
- Cartagena Protocol to the Convention on Biological Diversity (Adopted at Montreal on 29 January 2000).
- Convention to Ban the Importation into Forum Island Countries of Hazardous and Radioactive Waste and to Control the Trans-boundary Movement and Management of Hazardous Waste within the South Pacific Region (Waigani, PNG, 16 Sept, 1995).

3.1.2 Public Health Regulations (Revised 2008)

These regulations set out the required standards in and around villages for maintaining public health. In relation to the ICT project, 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;

3.1.3 Foreshore and Land Reclamation Act (revised 2008)

Under the Foreshore and Land Reclamation Act the State owns the foreshore and the seabed. The Act states the public notification procedures to be followed in order to establish a landing site, however it goes on to confirm that "nothing in section 4 shall apply to the construction of causeways and of landing-places by, or on behalf of, the Government…" therefore, no public process is required for establishing a landing-place on the foreshore.

Section 3(2) of the Act gives the Kaupule responsibility 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. Therefore the TvICT will require a permit for any cutting or trenching activities on the foreshore (which is defined as the area covered and uncovered by the tide). This does not extend beyond the vegetation line and therefore does not extend to the BMH.

3.1.4 Submarine Cable Installation Permits

3.1.4.1 Tokelau

Permits for installation of submarine cables within Tokelauan Territorial waters (<12nm offshore) are granted by the Taupulega as they are body charged with responsibility of the territorial waters.

The EEZ of Tokelau is administered by the New Zealand Government, specifically the Administrator of Tokelau who sites within the Ministry of Foreign Affairs. The NZ Exclusive Economic Zone and Continental Shelf (Environmental Effect – Permitted Activities) Regulations (2013) Article 8, Submarine Cables states that:

(1) The placement of a submarine cable on or under the seabed, or the removal of a submarine cable from the seabed, is a permitted activity if the person undertaking the activity concerned complies with the conditions in subclause (2).

(2) The conditions are that the person—
  - (a) complies with the pre-activity requirements in Schedule 1; and
  - (b) notifies the EPA, within 24 hours, of the date on which the person commences the activity concerned; and
  - (c) notifies the EPA, within 24 hours, of the date on which the person completes the activity concerned; and
  - (d) complies with the post-activity requirements in Schedule 4.

(3) The maintenance, repair, alteration, or extension of an existing submarine cable is a permitted activity.

(4) In subclause (3), existing submarine cable means a submarine cable that was placed on or under the seabed—
  (a) in accordance with subclause (1); or
  (b) before the date on which these regulations came into force.

3.1.4.2 Tuvalu

The Maritime Zones Act 2012 (Section 15) describes Tuvalu's rights in the EEZ and continental shelf, consistent with the relevant provisions of the United Nations Law of the Seas (LOS) convention. Part 16 (5) states that "subject to this Act, any other law of Tuvalu, and international law, all States shall enjoy in the EEZ the high seas freedoms of navigation and overflight and of the laying of submarine cables and pipelines, and all other internationally lawful uses of the sea related to those freedoms. Part 16 (6) goes on to state that "Subject to this Act and any other law of Tuvalu, all States may lay submarine cables and pipelines on the continental shelf in accordance with international law." Permitting through this Act for the laying cables in the EEZ is not referred to.

3.2 World Bank Safeguard Policies

Screening based on field investigations, stakeholder consultations and a review of potential options for implementation confirms an assessment of Category B for the Project. It finds that potential impacts are less significant, site specific, mostly reversible and that a range of potential measures for mitigation can be readily designed in the majority of cases.

The WB's environmental and social safeguard policies are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people, their livelihoods and their environment in the development process. The safeguards policy that applies is OP4.01 Environmental Assessment. The purpose of Environmental Assessment is to improve decision making, to ensure that project options under consideration are environmentally and socially sound and sustainable, and that potentially affected people have been properly consulted. The policy defines procedures to screen and assess potential impacts and mitigation, prepare safeguard instruments, ensure public consultation and transparency and that there are implementation and supervision of commitments relating to findings and recommendations of the environmental assessment.

Environmental assessment has been undertaken in accordance with this policy and this ESMP is the safeguard instrument for the TvICT Project for TA and physical investments. The 2023 restructure of the project does not increase the environmental and social risk classification of the Project. The existing version of the ESMP (version D) already included the requirement for E&S risk identification and management measures for small scale outer island works. This version of the ESMP (Version G) has been updated to include the other activities included in the new subcomponent 2b.

3.2.1 Gender Action Plan

Tuvalu has a National Gender Policy which is considered to be applicable to the TvICT Project. While this is not a requirement of the WB Safeguard Policies, 'Gender and Development' is part of the wider set of the WB's Operational Policies and is relevant to the consultation processes under the ESMP. The WB requires all WB projects to be gender informed. To be gender informed, all projects should include (i) Gender Analysis and/or consultation on gender related issues, (ii) Specific actions to address the distinct needs of women and girls, or men and boys, or positive impacts on gender gaps, and (iii) Mechanisms to facilitate monitoring and/or evaluation of gender impacts. The objective of the WB's gender and development policy is to assist member countries to reduce poverty and enhance economic growth, human well-being, and development effectiveness by addressing the gender disparities and inequalities that are barriers to development, and by assisting member countries in

formulating and implementing their gender and development goals.

Where relevant, the Tuvalu National Gender Policy is cross-referenced in the ESMP.

3.3 Comparison of Environmental Assessment Requirements

Table 1 Comparison of Environmental Assessment Documentation Requirements

Contents of Assessment Report	**Environmental Protection Act EIA Regulations**	**World Bank Safeguard Policies**
Report type / title	Preliminary Environmental Assessment Report (PEAR)	Environmental and Social Management Plan (ESMP) The World Bank policies are flexible. Use of in-country report type / title is acceptable to the WB, as long as the ESMP requirements are included.
Policy, legal and administrative framework		Yes
Description of development proposal	Yes. The PEAR requires the final project design to be defined.	Yes. The policy allows for options to be proposed as part of the description of the proposal, as long as all foreseeable risks and impacts are identified and suitably managed.
Description of area to be affected (environment and social)	Yes	Yes
Nature of proposed changes	Yes	Yes
Location Map / Site Plan	Yes	Yes
Justification for the proposal	Yes	Yes
Assessment of impacts	Yes	Yes (significant only)
Mitigation of impacts	Yes	Yes (significant only)
Alternatives	Yes	Not for ESMP, only ESIA
Public consultation		Required, and a summary provided in the report.
Institutional arrangements		Yes
Capacity building		Yes
Relevant actions from the Gender Action Plan		Yes
Budget		Yes

4 Environmental and Social Conditions

This section provides information on the physical, biological and social elements of the environment within the Project's scope. The environments described in this section span the full physical and social Area of Impact (AOI) of the Project. The AOI is considered to include Project sites such as installation sites, laydown areas, ports and haulage routes.

4.1 Location and Setting

Tuvalu is a Polynesian island nation that lies in the central South Pacific, west of the International Dateline and 1,000km north of Fiji. Three islands and six atolls that make up Tuvalu stretch for 580km and measure approximately 25km^2 in total land area. The capital of Tuvalu is the entire atoll of Funafuti, where the TvICT Project site is located.

Funafuti measures between 20 and 400 meters wide and is home to the capital and administrative center of Tuvalu. The proposed project sites are located on Fongafale along the length of the runway on both coast lines. The eastern side of the atoll is also where the majority of landmass is, and population reside.

On the western side of the atoll is the Kogatapu Funafuti Conservation Area, approximately 17km west of Vaiaku across the lagoon. The conservation area was established in 1996 and covers 33km^2 of reef, lagoon, channel, ocean and island habitats. There are six uninhabited islets with native broadleaf forests and coral sand beaches within the protected area and are home to coconut crabs, nesting seabirds and turtles.

4.1.1 Area of Influence (AOI)

To determine the geographic scope of this ESMP, it has first been necessary to determine the project's AOI. This is defined through consideration of the project footprint including all ancillary project components and also considering project impacts on various environment and social components. For the purposes of this assessment, the AOI has been determined based on best practices from previous similar studies and by adopting a precautionary approach. The AOI is described below in Table 2.

Table 2: Area of Impact for project sites and cable route

Environment	AOI
Offshore (>1000m water depth)	The accuracy of the placement of the cable on the sea floor reduces as the depth increases and currents play a part. A 500m corridor either side of the cable is a good precautionary limit for an AOI
Inshore & Coastal Waters (<100m water depth)	As the accuracy of cable placement increases, the AOI reduces. Taking a precautionary approach, a 250m corridor either side of the cable has been used for the AOI
Terminal stations	150m radius from the center point of new terrestrial buildings
Terrestrial cable route	A 20m corridor will be assessed for any terrestrial trenching activities.
Fiber cable roll-out	Cable pulling will be in existing ducts.

4.1.2 Land Use

Land availability on Funafuti is limited and informal land uses such as piggeries and gardens have encroached on idle government lease land. Three of the proposed LPs (LP 2, 3 and 5) are on the south eastern side of the island's runway and this land is primarily Government owned land with the meteorological services, Public Works Department (PWD) compound, the prison, the sports field, the Tuvalu Electrical Corporation (TEC) power station, the abandoned TTC satellite station, demonstration gardens (funded by The Republic of China (Taiwan)) and private pig farms on leased land.

The north (LP 4) (through counter-clockwise) to the south western (LP1) side of the runway is dominated by residential properties and is a mix of government and privately-owned land. Within this is the lagoon side of the atoll and is the location for a sixth proposed LP (LP 6) at the current TTC satellite station. The north eastern end of the runway is the ocean side of the atoll.

Proposed LP1 is on privately owned land used for residential or small business (local shops) purposes.

For the fiber cable roll-out, the cable pulling will be in existing ducts. No works will be financed on areas other than where Government has land tenure and access rights.

4.2 Physical Environment

4.2.1 Climate

Funafuti has a tropical climate with temperatures directly related to the ocean temperature and do not vary greatly from an average high of 31°C and an average low of 25°C. The wettest months are usually between November and April with the annual rainfall on Funafuti reaching over 3,000mm, averaging over 200mm per month.

Winds over Tuvalu are dominated by the south-east pacific trade wind belt just south of the dry belt of the equatorial oceanic climate zone. The cyclone season is from November to April with winds from the W to NW when strong winds and high rainfall can be expected. From May to October, the south-east trade winds are generally light. The predominant wind direction ranges between ENE to ESE for all the islands of Tuvalu.

In the 41-year period between 1969 and 2010, 33 tropical cyclones passed within 400km of Funafuti, an average of just under one cyclone per season[5]. The number of cyclones varies widely from year to year, with none in some seasons but up to three in others. Over this period, cyclones occurred more frequently in El Nino years.

Spring tides and tropical cyclones are among the main extreme events that affect Tuvalu. As well as high winds and rainfall, tropical cyclones also cause storm surges and swells. When combined with high tides, this can result in waves washing over low sections of the atolls. The resulting flooding causes agricultural losses (particularly of Taro crops) increase soil salinity, damage buildings, disrupt road access, contaminate ground water and enhance coastal erosions processes.

4.2.2 Geology and Bathymetry

Funafuti is a coral atoll and as such the surface soils are derived from limestone which is the result of coral reef deposits. Soil quality and saltwater contamination of the underlying freshwater lens has meant that intensive horticulture is not possible. Produce tends to be grown in raised beds in topsoil.

[5] Government of Australia and Pacific Climate Change Science Program. 2011. Current and Future Climate of Tuvalu (Canberra, Australia)

While generally limestone derived soils tend to be highly porous, in the more densely populated areas

of Funafuti compaction of the soil, particularly on road verges and on the heavily trafficked ocean side of the runway, causes localised flooding during heavy rainfall events.

Moving offshore from Funafuti and passing the (approximately) 150m wide reef platform, the atoll flank has an average seaward slope of 26°, which is highly variable with a maximum of 79° closest to the proposed landing sites. A near continuous shoreline parallel terrace and break in slope in water depth of 100-150m is observed approximately 100-450m seaward of the reef crest. The northwest, southeast and southwest flanks of the atoll exhibit numerous stacked high gradient slopes. From the reef crest there is a sharp increase in depth to 1,000m at about 200km offshore and from there, there is a significant change in bathymetry where the depth increases from 1,000 to 6,500m over a distance of 1.25km (Figure 32)[6].

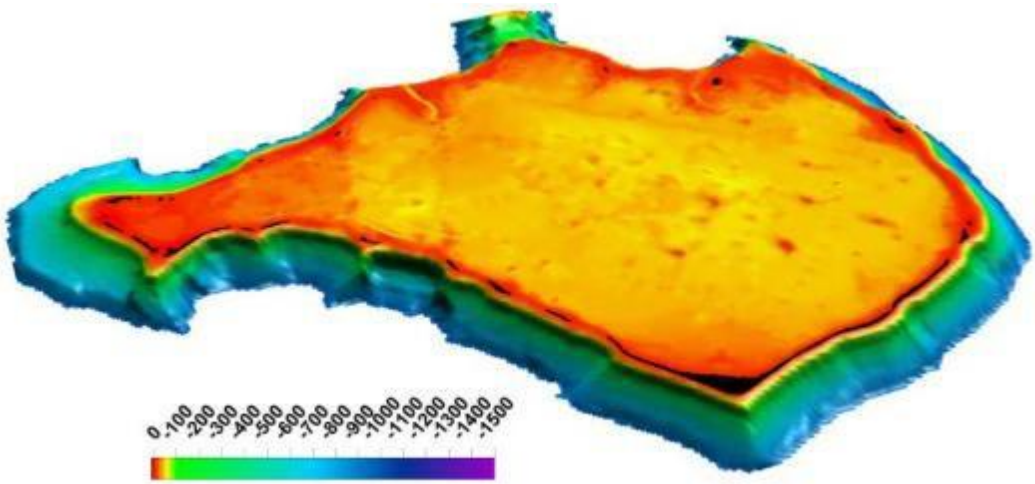

Figure 32: Perspective image of Funafuti atoll looking west. Land is shown in black and depth are in meters.

4.2.3 Water Resources

The lagoon is the largest in Tuvalu measuring 24.5km by 17.5km, with an area of 275km2. Some atolls have freshwater lenses underlying the landmass that sit on top of underground salt water. Funafuti's freshwater lens is no longer a viable source of freshwater due to pollution and salt water intrusion. The community rely on rainwater harvesting and three desalination plants. Therefore, water efficiency measures and rainwater harvesting are to be incorporated into the design of the Terminal Station. During the construction stage the Contractor will be responsible for securing a water supply which does not adversely affect the community's freshwater reserve.

4.2.4 Natural Hazards & Climate Change

Tuvalu faces a moderate degree of natural disaster risk; however even minor emergencies can overwhelm national capacity.

The 2015 TC Pam did not cause any major damage on Funafuti. In 1997, three tropical cyclones hit Tuvalu; Gavin and Hina in March, and Keli in June. Following these storms, it is estimated that approximately 6.7 percent of Tuvalu's total land mass had been washed away. Tuvalu also declared a national emergency in September 2011 due to severe drought.[7]

[6] High Resolution Bathymetric Survey of Tuvalu. EU-SOPAC Project Report, 2008

[7] http://www.unocha.org/office-pacific-islands/tuvalu

The Pacific Climate Change Science Program (PCCSP) has undertaken extensive climate prediction modelling of the entire Pacific region and has made detailed predictions about the likely climate change scenario for Tuvalu for 2030 and 2090.

Tuvalu, like many other pacific atoll nations are already experiencing the effects of increased temperatures and rising sea level. The sea level has risen by 5mm per year since 1993. Sea level does fluctuate throughout the year, peaking in February and March, particularly during La Nina years which tend to record warmer ocean temperatures. The annual mean air temperature (since 1950) has increased by approximately 0.24°C per decade. Annual and seasonal rainfall trends have not shown significant trends (1950 to 2009).

Climate change predictions for 2030, 2055 and 2090 (relative to 1990) were reviewed. The PCCSP report reviewed a number of climate projection models to determine the most plausible representations of future climate in the pacific under three emission scenarios (low, medium and high). Table 3: Air temperature and sea level rise projections for the three emission scenarios and three time periods. Below shows the projected changes in annual average air temperature and sea level rise for Tuvalu for the three emission scenarios and the three time horizons. Sea level rise should be considered when establishing the design Terminal Station floor levels and the BMH depth.

In the short term (2030) the climate models prediction for rainfall do not increase (or decrease) significantly. However, by 2090 it is expected that rainfall will increase. There is only moderate confidence in the models prediction. There is high confidence that the intensity and frequency of extreme rainfall days are projected to increase. As most runoff from rain events goes to natural soakage this does not impact on the detailed designs.

Table 3: Air temperature and sea level rise projections for the three emission scenarios and three time periods.

Annual Average Air Temperature Projection				Sea Level Rise Projection			
Values represent 90% of the range of the models and changes are relative to the average of the period 1980-1999.							
	2030 (°C)	2055 (°C)	2090 (°C)		2030 (cm)	2055 (cm)	2090 (cm)
Low emissions scenario	0.3–1.1	0.7–1.5	0.9–2.1	Low emissions scenario	4–14	9–25	16–45
Medium emissions scenario	0.4–1.2	1.0–2.0	1.5–3.1	Medium emissions scenario	5–14	10–29	19–56
High emissions scenario	0.4–1.0	1.0–1.8	2.1–3.3	High emissions scenario	4–14	9–28	19–58

Source: PCCSP, 2011. Current and future climate of Tuvalu Brochure. Tuvalu Meteorological Service, Australian Bureau of Meteorology and CSIRO.

4.3 Biological Environment

4.3.1 Terrestrial Environment

Funafuti is a narrow, densely populated landmass which has undergone significant anthropogenic changes. Coconut, breadfruit, and pandanus dominates the landscape as do pawpaw and other food crops. The vegetation has been affected by the contamination of the freshwater lens with salt water and subsistence crops require careful cultivation and application of compost and nutrients to sustain

the crops. In Tuvalu nearly 65% of the flora is not native.

Within the potential landing sites, the ocean side LPs are characterized by scattered coastal trees and low lying scattered vegetation amongst the existing infrastructure along the shoreline. The lagoon side LP (LP6) transitions from sand to grass and low-lying scrub with occasional trees between the grass and the road (Figure 33).

Figure 33: Typical beach and vegetation line of lagoon side landing (left) and ocean side landing (right)

Tafua Pond is a 1.39 ha natural pond, rather than an old borrow bit, which is surrounded by a dense mangrove stand (*Rhizophora stylosa)* lining its shore which are up to 40m wide on the south eastern banks. Tafua Pond is the remains of a much larger low-lying area which was filled during the construction of the airstrip in 1942. On the landside, the pond is bordered by piggeries (Figure 8) and the quality of the water has greatly decreased due to the impact of the effluent that flows into it. This site has been proposed by the Funafuti Kaupule in cooperation with TANGO as a potential site for environmental restoration and milkfish (*Chanos chanos*) production.[8]

4.3.2 Marine Environment

The marine habitats of the potential landing sites encompass two main types:

LPs 1 – 5: These sites consist of upper intertidal rocky beaches, intertidal reef flat and sub-tidally, the reef slope. The intertidal reef flat is rocky and undulating with several peaks and troughs across its width. The habitat is bare rock with sporadic coral species adapted to the high energy environment and some sparse patches of low growing coralline and turf algae. Benthic invertebrates are observed infrequently.

LP 6: This site consists of an upper intertidal sandy beach, intertidal sand flats and the subtidal deeper sandy lagoon floor. The upper sandy beach is currently impacted by infrastructure development activities of the neighbouring land reclamation works. An excavator was observed driving along the beach during the site survey. The intertidal zone is scattered with occasional rock where collections of small gastropod species can be observed. The sandy lagoon floor is populated with scattered coral bommies and outcrops.

[8] Tuvalu Technical & Country Mission Report – Assessment of Aggregate Supply, Pond and Lagoon Water Quality & Causeway Construction on Funafuti and Vaitupu Atolls. SOPAC, 2014.

Deep Ocean: The deep ocean environment has not yet been surveyed. However, it is possible that both hydrothermal vents and/or seamounts may be encountered along the route. A hydrothermal vent is a fissure in the earth's crust from which geothermically heated water issues. The areas around submarine hydrothermal vents are biologically very productive, often hosting complex communities fueled by the chemicals dissolved in the vent fluids. Common organisms found at the vents include giant tube worms, clams, limpets and shrimp. These communities exist independently of the sun and depend entirely on the bacteria produced by the hydrothermal vents chemicals to survive.

Deep water sea mounts are often hotspots for biodiversity by providing plenty of complex structure for animals to attach and grow. Sea mounts also create nutrient rich upwellings of deep water which result in them carrying above average plankton populations, seamounts therefore become stations where plankton feeding fish aggregate, in turn falling prey to further predation from species higher up the food chain.

4.3.3 Whales and Dolphins

The EEZ and territorial waters of Tuvalu and Tokelau both a have records of several species of cetaceans (whales and dolphins).[9]

Tokelau:

- Orca (Killer whales, Orcinus orca) have been reported in small concentrations in Tokelauan waters
- Sperm whales (Physeter macrocephalus) are also recorded within Tokelau waters, although they are considered to be rare sightings. The Sperm whale is listed as vulnerable on the IUCN Red List.
- Other species recorded include: Blainsville beaked whale (*Mesoplodon densirostris*), Gingko-toothed beaked whale (*Mesoplodon ginkgodens*), spinner dolphin (*Stenella longirostris*) and pygmy killer whale (*Feresa attenuate*)

Tuvalu:

- Orca have been spotted in small concentrations in Tuvaluan waters;
- Historically, the distribution of Sperm whales has been recorded along the southern islands of Tuvalu;
- Tuvalu is recorded as part of the geographic range of pantropical spotted dolphin (*Stellena attuenata*);
- Spinner dolphin (*Stellena longirostris*) and bottlenose dolphin (*Tursiops sp*.) are also recoded in Tuvaluan waters.

[9] *Miller, Cara (1 July 2009). Current State of Knowledge of Cetacean Threats, Diversity and Habitats in the Pacific Islands Region. WDCS Australasia Inc. pp. 49–50.*

4.4 Socio-Economic Environment

4.4.1 Population and Demographics

As of 2017, Tuvalu has an estimated population of 11,052 and growing at 0.82%. The population is relatively young with median age of 25.2 years. The country has a high out-migration rate with about 6.81 migrants per 1000 population. There is slightly higher number of females than males with about 103 females per 100 males. The capital Funafuti accounts for 57.2% of Tuvalu's population as of the 2012 census with a population density at Funafuti of 2,220 per sq. km. In terms of ethnicity Tuvaluans are 96% Polynesian and about 4% Micronesian. Religion is more than 99% Christians, with 97% members of the Church of Tuvalu. The languages are Tuvaluan, English, Samoan and iKiribati (principally on the Island of Nui).

4.4.2 Education and Health

On Funafuti there is one government primary school and one Seventh Day Adventist primary school which have a register of over 900 pupils. There is one secondary school on Funafuti run by the Church of Tuvalu (EKT). The University of the South Pacific (USP) Extension Center on Funafuti operates the Augmented Foundation Program for sixth form students who pass their Pacific Secondary School Certificate so that students can enter tertiary education outside Tuvalu.

On Funafuti is also the Tuvalu Maritime Training Institute which provides training to approximately 120 maritime cadets each year to provide them with the basic skills necessary for employment as seafarers on merchant shipping.

Funafuti has the only hospital in Tuvalu, the Princess Margaret Hospital which is the primary provider of medical services for all islands of Tuvalu. The hospital is located about 1.3km north from the center of Funafuti. The hospital has 50 beds and offers basic routine medical, surgical, obstetric and gynecological services.

Non-communicable diseases (NCDs) are one of the leading causes of mortality. The common types of NCDs in Tuvalu are body aches and pains which relates headache, backache, toothache, unspecific abdominal pain, lifestyle diseases (diabetes, hypertension, arthritis/gout, obesity and heart disease) and injuries or accidents.

There are no private formal medical services on Funafuti. NGOs such as the Tuvalu Red Cross Society, Fusi Alofa (for the care and rehabilitation of disabled children), the Tuvalu Family Health Association and the Tuvalu Diabetics Association all have offices in Funafuti.

4.4.3 Livelihood and Economic Activities

Tuvalu's economy suffers from problems of geographic isolation, few resources, and a small population. The country has no known mineral resources and few exports. Subsistence farming and fishing are the primary economic activities. The islands are too small and too remote for the development of a large-scale tourist industry. Income from fishing license fees, remittances, surpluses from the Tuvalu Trust Fund, and rent of its '.tv' internet domain are highly variable. There is high resilience on imported goods as there is very little manufacturing on the island due to the lack of resources and water. Some marine resources and coconut products are exported but most people derive income from maritime workers and family members working overseas through remittances sent to their families.

The 2010 Household and Income and Expenditure Survey reported the average monthly household consumption expenditure as AU$1,331 of Funafuti, compared to the monthly average household

income of AU$1,364. Approximately 90% of Funafuti households reported earning a wage income.

4.4.4 Land and Tenure Rights

The land tenure system is largely based on extended family ownership making land availability for business development restrictive. On Fongafale, it is prohibited to build a house or an extension to an existing building even on private land unless approved by the Funafuti Kaupule in cases of privately owned lands, and by the Lands Management Committee in cases of lands leased by Government. This helps control vegetation clearance, beach mining and density.

There is a well-developed system of land leasing by the Government, and there is a universal land lease rate per hectare per year.

5 Stakeholder Engagement

Stakeholders require engagement across the TvICT, for physical investments, policy development, and other aspects.

During the detailed planning phase for the cable installation, BMH construction, terrestrial cable laying, CLS construction or rehabilitation, and the pulling of the fiber cable, stakeholder engagement is essential to the review of detailed designs and the selection of mitigation options for identified social and environmental impacts. It is important that any affected communities – including women and vulnerable groups such as people with disabilities, youth, elderly etc. – are given the opportunity through consultations to be made aware of the proposed activities, and to comment and contribute to the project design. MJCFA is responsible for ensuring meaningful consultations for all components of TvICT.

5.1 Stakeholder Identification

A stakeholder is defined as a person or group who has an interest in a particular decision or activity relating to TvICT, either as an individual or as a representative of a group. This includes people who can influence a decision, or can influence actions, as well as those affected by it.

For the TvICT, stakeholder groups will vary across the project components and will also depend on the final selected LP. Stakeholders for project sites have been and will continue to be identified on an ongoing basis by:

- Identifying the various categories of parties who may be affected by or interested in the project; and
- Identifying specific individuals or organisations within each of these categories taking into account:
    - The expected AOI of the project, that is the geographic area over which it may cause impacts (both positive and negative) over its lifetime, and therefore the localities within which people and businesses could be affected;
    - The nature of the impacts that could arise and therefore the types of government bodies, NGOs, academic and research institutes and other bodies who may have an interest in these issues.

5.2 Stakeholder Groups

Stakeholder groups applicable to TvICT are listed and described below.

Category	Group	Relevance
National Government	Department of Environment	Responsible for assessing PEAR submissions and issuing development consents. Also responsible for monitoring the conditions of the development consent.
	Department of Lands and Surveys	Ministry with responsibility over the Foreshore and Land Reclamation Act. Holds records of land deeds, ownership, leases and boundaries.
	Tuvalu Telecommunications Corporation	Telecoms provider (land line, mobile network, broadband and 3G/4G providers) for Tuvalu and owner of satellite bandwidth. Potential host for fibre optic cable CLS and potential distributor of connectivity.
	Ministry of Home Affairs and Rural Development	Administers the Kaupule Act and provides facilitation role for Kaupule and Falekaupule consultations.

	Marine and Ports	Managers and directs all large vessel marine traffic in Tuvalu coastal waters. Will be responsible for providing any coordination between cable laying vessels and other boats.
Local Governance	Funafuti Kaupule	Responsible for issuing Foreshore license for TvICT activities.
	Office of Home Affairs	Will provide assistance to Kaupule in issuing foreshore license.
Local Groups and NGOs	Tuvalu National Council of Women	The council consists of elected women and provides the formal link between Government and women's communities.
	Christian Church of Tuvalu (EKT)	Significant representation of communities is often provided through the church leaders.
	TANGO	Tuvalu Association of NGOs (TANGO) provides a policy voice within government and provides information and communication to its 48 members and the local community.
Project Affected Communities and Individuals	Demonstration Gardens (Technical Mission of Republic of China)	Subject to the selection of the final LP, BMH, cable trenching route and CLS location, there may be a need to undertake construction works in close proximity to the demonstration gardens.
	Local Communities	The construction phase is likely to have minor short-term impacts on the communities in and around the project sites (works, ancillary and haulage routes). The operational phase of the project is likely to have long term positive impacts on the community. Consultation for both of these phases will be critical.
	Public	The wider Fongafale public will be stakeholders in the development and implementation of the TvICT Project as they will be impacted through changes to access to communications once the cable is commissioned.

5.3 Stakeholder Engagement and Consultation Plan (SECP)

The SECP needs to be implemented, updated and refined throughout the lifecycle of the Project. During this process the focus and scope of the SECP will change to reflect the varying stages of project implementation and to encompass any changes to project design. The implementation plan is included in Table 4.

The mode of consultation will vary according to the participants, but in all cases will promote participation by ensuring that the venue is accessible, the timing convenient and the manner of conduct of the consultation socially and culturally appropriate. Consultations will be announced to give sufficient notice for participants to prepare and provide input to project design.

Minutes will be recorded for all consultation meetings. Consultations undertaken prior to finalisation of the ESMP (pre-appraisal) were addressed and incorporated where appropriate throughout the ESMP. For subsequent consultations, the PIU Safeguards Advisor will be responsible for taking any comments forward to either the PIU PM or the Contractor for incorporation. Minutes of consultations and actions taken based on those comments will be included in project reporting.

5.3.1 Key Messages

Key messages should be developed as the Project is prepared in more detail during implementation. The key messages should be developed around the following and confirmed once the project details are confirmed:

- Fibre optic cable connectivity will enable faster and potentially lead to cheaper internet access

for the general public and businesses in Tuvalu.

- The outer islands of Tuvalu may benefit from increased speed of their existing connections due to the transfer of Funafuti onto the Fibre Optic cable network and subsequently from any planned investments in satellite sub-divisions of the cable capacity to the outer islands.
- Construction works will be small scale and limited to the more commercial areas of Funafuti.
- For the fiber cable roll-out, the cable pulling will be in existing ducts.

5.3.2 Implementation Plan

The Implementation Plan (Table 4) for the Project constitutes the following components:

Activity: the various operational consultation activities that will be undertaken as part of the SECP
Objective: the target that each activity needs to reach
Stakeholder: the various stakeholders to be targeted during implementation of the SECP activity; and
Medium: the method by which the engagement or consultation will be done

The MJCFA will be responsible for early consultations and engagement., but once the PPP is established it will also have engagement responsibilities for activities under subcomponent 2a.

Table 4: Stakeholder Engagement and Consultation Implementation Plan

No	SEDP Activity	Timetable	Objective	Stakeholders	Medium
A: Physical investments					
A1	Feasibility, decision on the final sites	From Project preparation through to final design.	Bring relevant stakeholders along with the decision making around the landing and CLS sites. Discuss potential impacts and mitigation measures. Key messages	National Government Local Governance Pig farmers, demonstration gardens, landowners	One-on-one meetings Group meeting with refreshments Structured group meeting with refreshments
A2	Disclosure of the ESMP	Prior to project appraisal Redisclosed after restructuring	Advise stakeholders of landing site options and mitigation and management plan. To seek input into the final landing site, design and mitigation measures.	Local Governance (Kaupule) All identified: Local groups, NGOs, Project affected Communities and Individuals	Group meetings with refreshments Translated Executive Summary Community consultation presentation and information session with refreshments

No	SEDP Activity	Timetable	Objective	Stakeholders	Medium
			To disclose ESMP and updated ESMP	All identified	Public flyer, radio announcement, website, hard copies.
A5	Commencement of Works	Two weeks before commencement of any works.	To reconfirm ongoing consultation, feedback and GRM processes	Community Site occupants (State owned enterprises. Government agencies)	Community Notice Boards Building Site/Landing Site Notice Board Website
A6	Outer Island connectivity strategy	During preparation of strategy report	To capture current situation on islands, existing island infrastructure, availability of sufficient space in existing TTC compounds and logistical considerations of each island	Outer island communities and Kaupule members residing on Funafuti National: Department of Home Affairs TTC	Consultation with refreshment One on one meeting One on one meeting
A7	Outer Island installations	Prior to delivery of materials	To inform of activities and project objectives. To seek input into the project installation approach and mitigation measures. To advise of GRM	Kaupule Outer Island Communities	Consultation with Refreshments
A8	Fiber cable roll-out	Two weeks before commencement of any works	To inform of activities and project objectives. To advise of GRM	All identified: Local groups, NGOs, Project affected Communities and Individuals	Public flyer, radio announcement, website, hard copies.
B: ICT Policy Development and Sector Reform					
B1	Development of policy	Once consultants are engaged and assisting MJCFA Throughout duration, as required.	Seek input from stakeholders in ICT Sector to define issues	National Government, Local Governance, NGOs, TTC	Meetings emails

No	SEDP Activity	Timetable	Objective	Stakeholders	Medium
B2	Institutional Development for MJCFA	Once consultants are engaged and assisting MJCFA	Seek input from stakeholders in ICT Sector to define issues	MJCFA, ICT Department, TTC	Meetings emails
		Throughout duration, as required.			

5.3.3 Resources and Responsibilities

The implementation of the SECP will be the overall responsibility of the MJCFA PIU, with support from the PPP and Contractors as required. The PIU will recruit a part time Safeguards Advisor who will take the lead role in the implementation of the SECP. The PIU Safeguards Advisor will be responsible for arranging and facilitating the meetings as it appropriate with their in-depth knowledge of the natural, social and traditional environments within Tuvalu. The PIU Safeguards Advisor will also be the focal point for all stakeholder queries and contacts in relation to the implementation of the SECP or the GRM.

It is also the responsibility of the PIU to ensure that gender balance is achieved throughout the implementation of the SECP and should ensure culturally appropriate strategies are used to achieve this such as separate meetings for males and females, or targeting female input through women's groups.

5.4 Consultations

A series of meetings with key stakeholders were held during project preparation with the Director of ICT Department, Permanent Secretary of MCT (now MJCFA), Director of ICT, Director Marine and Ports, WB Task Team, Department of Environment, Department of Waste Management and the Climate Change and Disaster Management Department Technical Advisor.

The aim of these meetings was to get input into the development of the ESMP and into the site selection comparison in Section 2.4.1.

The outcomes of the meetings were as follows:

Director ICT:

- Concerns over climate impact on cable if it is laid over the reef flat from the ocean side as the environment is high energy and open to cyclone winds and waves.
- Would like to see the inclusion of lagoon side landing in the ESMP to make sure that all options are considered from a safeguards standpoint.
- If a lagoon side landing is considered, then a LP next to the existing wharf in front of the current TTC station would be most appropriate.
- Small scale subsistence fishing occurs within the deeper waters of the lagoon.
- The local inter-island ferries and cargo vessels use two main channels, one of which would also be suitable for the cable entrance.

Permanent Secretary MCT:

- There are several options for cable connection, but the preferred one is the Southern Cross NEXT at Tokelau

Discussions are still underway about connectivity for the outer islands, with satellite being a likely option for this.

Director Marine and Ports:

- The anchorage zone within the Funafuti Harbour is marked on the navigational marine charts and is to the north of the port, which is away from the potential cable route within the lagoon.
- Creating a no-anchor zone within the lagoon to offer protection for a cable would be possible.

WB Task Team:

- When the TVICT Project was in pre-appraisal stage. Two technical advisors were bought on to assist with (i) policy and legislation; and, (ii) legal advice.
- It was expected that the PAD and ESMP will go before the WB Appraisal Board in August/September 2018.
- ESMP is the required safeguards instrument and it will evaluate the proposed landing sites to assist with final selection.

Department of Environment:

- First step of the Development Consent process is submitting a notification of development for the DoE to review and determine the level of environmental assessment that will be needed. As the TvICT project is following WB OP, it will be subject to an ESMP, but, pending site selections, to fulfil national obligations, a notification along with the fee of AUD$500 may still have to be completed and submitted.
- DoE use a standard monitoring form so we can look to incorporate that into the ESMP monitoring requirements should a Development Consent be required.
- Consultant confirmed that no aggregate extraction will be permitted within Tuvalu.
- ESMP review can be done using local consultants to help with the capacity (human resources) limitations. SPREP often do it for them and can be utilised to provide additional coastal assessment expertise. SPREPs services will be at the cost of the proponent. Usually it takes 20-30 days to review the ESMP, then the ESMP taskforce makes recommendations and decision. Once the task force is satisfied, then the Minister signs the Development Consent. Conservatively 8 – 10 weeks to process application.

Department of Waste Management:

- The landfill on Funafuti is small scale landfills and not suitable for project waste.
- DWM have a policy which gives guidelines for the project to follow
- DWM processes export of hazardous materials and provides the export paperwork. DWM also liaise with the receiving country. Details of the hazardous waste will be given to the DWM
- Recyclable waste is collected by DWM in Funafuti at the transfer station as per the policy document.
- Composting happens at the island scale. Each Kaupule has a compost area and a shredder for all green waste.
- Leftover stockpile aggregate can be used by the Kaupule as they see fit. Any leftover stockpile can be given to DWM to cap the Funafuti landfill.
- Waste lubricant oil to be given to DWM for storage and export (as per policy).
- Scrap metal to be given to DWM to contribute to their export tonnage requirements under EU partnership program.

Climate Change Policy and Disaster Management Unit:

- Previous lessons learned from other projects:
  - Labour rights and access to employment for local communities.
  - Housing supply on islands.
  - Water resources: drought watch in place for Funafuti for 2018.
  - Not clear how to access GRM to submit complaints.
- An environmental management plan has been developed for the national adaptive program of action (NAPA). This wasn't appropriate as it included measures which weren't appropriate for the local context. Became a tick box exercise.
- There are penalties in the Environmental Protection Act which should be incorporated to compliment the Particular Conditions of Contract clauses in the contractors contract.

TANGO

- TANGO agreed to notify its membership about the Project
- TANGO is happy to lend support in any training for the implementation of the Gender Based Violence prevention and awareness training.

5.4.1 Consultation Workshop

- An initial community consultation workshop was held on 12 September 2018. Community leaders, the Funafuti Kaupule, pig farmers from the original proposed landing sites, members of the Vaiaku community, stakeholders from various Government departments, Church leaders, NGOs and Women's groups were invited to attend. Approximately 20 stakeholders accepted the invitation to join the session. The outputs of the consultation workshop have been incorporated into the ESMP where appropriate and the full report along with a list of attendees can be found in Annex C.
- In summary, the following key points were made:
  - Funafuti Kaupule imports aggregates for construction projects and can supply this project.
  - TTC expressed their concern that the proposed technical solution of a Fibre Optic cable to increase connectivity is an expensive option to maintain from a business perspective and that other options, such as investment in the satellite network, could have been a more efficient solution. TTC were advised that initial thinking was for a satellite investment, however it is the GoTv preference for a fibre optic cable and that other key sectors (health, education, banking, etc.) also need this technologically progressive solution and do not wish to rely on the satellite network which has its ongoing issues.
  - TTC reiterate preference to retain some satellite capacity and it was confirmed to them that the cable will only serve Funafuti and that satellite linkages for the outer islands will still be retained.
  - TTC prefers Fiji as a linking hub for the cable as there are more cables in Fiji which might reduce the risk of disruption.
  - TTC agrees with installation on the ocean side of Funafuti but would prefer proposed landing site 1 or 2 to avoid further trenching next to the runway and to utilise the existing ones.
  - TTC also noted their disappointment at the limited attendance of the invitees to the workshops. It was discussed that this is just the initial consultation and that more are planned to be held during project implementation. Community consultations will be ongoing and it is hoped that more community members will attend in the future.
  - Funafuti Kaupule raised concerns over whether there would be a sustainable plan in place for repairing any damage to the cable once it is installed.
  - TTC requested more information on ongoing maintenance costs of the cable once it is installed.

5.4.2 Consultation Before Civil Works Begin

A final consultation with key stakeholders was held on 10 November 2023 before the commencement of civil work for the project. Key stakeholders were invited to attend this very important meeting, and fortunately majority of them were attended the meeting with two members didn't attend the meeting including ICT and Lands Department. Attended key stakeholders were members from Funafuti Kaupule, Tuvalu Electricity Corporation (TEC), the Department of Environment, Department of Local Government, Department of Waste Management, Tuvalu Telecom Corporation (TTC) and Public Works Department. Consultation Attendance List is attached at the last page of this document. The aim of the consultation to inform key stakeholders on project activities and scope of work, with improvement and finalizing the environmental and social management plan for the project.

In summary of the key point discussed by stakeholders:

- TTC explained project activities and the scope of work that covered Funafuti fiber network and upgrading Outer Island network.
- CPMO briefly elaborates the purpose of the ESMP with key major risks that may potentially exist during the civil works, with mitigation measures to address those major risks. Grievance Redress Mechanisms procedures were discussed to ensure stakeholder aware and understood the procedures and focal point if there is any complaint from the public and how the project can address those complaints.
- TEC expressed concern on the fiber network in Funafuti given the cobber wire network were laid below electricity cable which may accidentally damage by this civil works. TEC advised TTC to carefully monitor this civil work to ensure electricity cable is safe and the safety of nearby communities. TTC responded that the existing copper network had investigated and was free from any damaged piping or cable. The removal of copper cable and replaced with fiber cable network does not require any digging in the ground surface. The TTC and the contractor will ensure the project is avoid any potential risks and incident that may accidentally occur.
- Department of Environment remind the project that Environmental Impact Assessment application to be submitted to the department for screening and scoping to obtain an environmental permit for the project before civil works begin.
- Department of Waste Management advised the project that all kind of waste generated by the project to be removed from Tuvalu under the contractor's expenses. Contractors is accountable for managing the waste and transported outside of Tuvalu as according to the national law of Tuvalu (Waste Management Act 2017). TTC responded that they had informed the contractors to transport recyclable waste to overseas for recycling. CPMO responded that the project had to make sure the contractor followed the national law for waste management.

5.5 Grievance Redress Mechanism

A grievance redress mechanism (GRM) is presented below to uphold the project's social and environmental safeguards performance. The purpose of the GRM is to record and address any complaints that may arise during the implementation phase of the project and/or any future operational issues that have the potential to be designed out during implementation phase. It should address concerns and complaints promptly and transparently with no impacts (cost, discrimination) for any reports made by project affected people (APs). The GRM works within existing legal and cultural frameworks, providing an additional opportunity to resolve grievances at the local, project level.

The key objectives of the GRM are:

- Record, categorize and prioritize the grievances;
- Settle the grievances via consultation with all stakeholders (and inform those stakeholders of the solutions);
- Forward any unresolved cases to the relevant authority.

As the GRM works within existing legal and cultural frameworks, it is recognized that the GRM will comprise community level, project level and Tuvaluan judiciary level redress mechanisms. The details of each of those components are described as follows.

5.5.1 Community Level Grievances

Community level grievances are most likely with the proposed project. Issues related to encroachment across land boundaries, noise, dust, and resource use should be expected and planned for.

Discussions with the Kaupule for other WB Projects on Funafuti have identified the following process which will be used to address the issues and concerns that an affected party (AP) may have. The key point of contact for the AP will be the Kaupule who will likely liaise directly with the Contractor or PIU. The party receiving the complaint will receive and document all matters and issues of concern from the local community and forward copies of all grievances to the Contractor and PIU, which will operate under the Executing Agency (MJCFA).

At all times it is the responsibility of the PIU to record, manage and close all grievances. Management of grievances may include instructing the Contractor to resolve the matter. If the Contractor receives the grievance and is able to effectively resolve the matter to the satisfaction of the AP, the Contractor will provide the PIU with the details who will then record the matter.

For concerns such as damage to trees or food gardens i.e., taro plots without permission or compensation, the AP will discuss this with the Kaupule, who will then raise the matter immediately with both the Contractor and the PIU, if unresolved at the project site. If the concern can be addressed without delay, and the outcome is satisfactory to the AP, the matter is closed. The Contractor will provide a report to the PIU Safeguards Advisor as soon as the complaint has been resolved.

For more extensive complaints such as damage to buildings or land issues such project/Contractor's encroachment on someone's land, the PIU will document and record the grievance and manage the response process. APs can submit these types of complaints through any number of channels including via the Kaupule or other third party; directly to the Contractor or PIU; in writing; anonymously; verbally; etc. The complaint must be acknowledged within 24 hours of it being lodged. The timing and

manner in which it will be resolved will be conveyed to the AP within 48 hours. The delegated party will provide a corrective action report to the PIU as soon as the action has been taken.

Should the complainant remain unsatisfied with the response of the delegated party, the complaint will be referred to the PIU Project Manager.

Specifically:

1. The PM will take earnest action to resolve complaints at the earliest time possible. It would be desirable that the AP is consulted and be informed of the course of action being taken, and when a result may be expected. Reporting back to the complainant will be undertaken within a period of two weeks from the date that the complaint was received.
2. If the PM is unable to resolve the complaint to the satisfaction of the AP, the complaint will then be referred by the PM to the Permanent Secretary (PS) MJCFA. The PS will be required to address the concern within 1 month.
3. Should measures taken by the PS fail to satisfy the complainant, the aggrieved party is free to take his/her grievance to the Tuvaluan Court, and the Court's decision will be final.
4. The community will be informed of the GRM through a public awareness campaign and discussion with the Kaupule. The Project shall also erect appropriate signage at all works sites with up-to-date project information and summarizing the GRM process, including contact details of the PIU Safeguard Advisor. Public information bulletins websites and other public information will also include this information. Anyone shall be able to lodge a complaint and the methods (forms, in person, telephone, forms written in Tuvaluan) should not inhibit the lodgement of any complaint.
5. The Complaints Register will be maintained by the PIU Project Manager, who will log the: i) details and nature of the complaint ii) the complainant name and their contact details iii) date iv) corrective actions taken in response to the complaint. This information will be included in MJCFA's progress reports to the WB.

If the complaint is not resolved by the PIU or Contractor to the satisfaction of the AP, then the Kaupule will forward the complaint directly to MJCFA, and with a copy to the Ministry of Home Affairs. The PIU can also escalate complicated grievances to the MJCFA. The matter will be addressed with due consideration to the seriousness of the complaint and be carried out promptly by the Permanent Secretary (PS), MJCFA. The PS MJCFA, will attend to the complaint within 24 hours and advise the Kaupule how it will be addressed. MJCFA will decide within two weeks. The AP may, if so desired, discuss the complaint directly with the PIU or its representative at a mutually convenient time and location. If the complaint of the AP is dismissed, the AP will be informed of his/her rights in taking the complaint to the next step. However, every effort will be made to resolve the issue to the mutual satisfaction of both the parties.

Should this process not resolve the matter, or at any time during the process, the AP may file a grievance on the World Bank website www.worldbank.org/GRS or can take the grievance to the Tuvalu Judicial System. The filing of the grievance will be at the AP's cost, but if the court shows that PIU has been negligent in making their determination, the AP may seek costs.

Where issues caused by the project are raised and resolved through these existing community level grievance redress mechanisms, it is important that these are captured by the PIU, which is responsible for recording all complaints/outcomes, and to help, as required for their resolution.

5.5.2 Tuvalu Judiciary Level Grievance Redress Mechanism

The project level process will not impede affected persons access to the Tuvalu legal system. At any time, the complainant may take the matter to the appropriate legal or judicial authority as per the laws of Tuvalu.

6 Environmental and Social Management Plans

6.1 Introduction

Section 6 contains the required management plans for the fibre optic cable design and installation, the activities included in the expanded subcomponent 2b, and the technical advisory roles required to support Project implementation. Section 6.2 identifies the significant potential environmental and social impacts and provides measures to avoid or reduce the impact along with the implementation strategies for each measures. Section 6.3 identifies the required monitoring and supervision requirements to ensure that the mitigation measures are being effectively implemented and that the Project is progressing in compliance with the requirements of the ESMP.

Mitigation and monitoring requirements are provided for the design or pre-construction phase, the construction phase, and the operational phase of Project implementation.

Section 6.4 provides the safeguard requirements of the technical advisory roles and provides the basis for the safeguard aspects of the Terms of Reference.

In addition to the planned investments in Funafuti, this ESMP provides guidance on how it should be applied to any technical advisory or physical works relating to ICT investments on the outer islands under this project (Section 6.5).

The roles and responsibilities are detailed in Section 7. The implementation arrangements are:

- The PIU will be responsible for overall safeguards oversight and implementation of safeguards for Component 1 and the supervision of safeguards for any services they procure and oversight of the Contractors and PPP Private Entity activities under subcomponent 2a.
- The TTC will be responsible for safeguards implementation for any activities they deliver under subcomponent 2b

6.2 Significant Impacts and Mitigation Measures

Table 5 Summary of significant potential impacts and key mitigation measures and implementation approaches for potential investments under the TvICT Project

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
1 Design/Pre-Construction Phase						
General						
Safeguard Integration	No safeguard requirements being adhered to or considered during the design process	• The ESMP shall be included in the TORs or partnership agreements. • Feasibility and detailed design studies to be informed by the ESMP, PIU Safeguards Advisor and stakeholder engagement. All impacts shall be avoided where possible through site selection, prioritisation of sites and technologies and consultation.	Funafuti	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
	No safeguard requirements being captured within the works agreement with the PIU	• Use of ESHS clauses from World Bank Standard Bid Documents for small works (Jan 2017) with the works agreement. • Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 7.	Funafuti	During preparation of works agreement	PIU Procurement Team	PIU Safeguards Advisor
	No safeguard requirements being contractually applicable to the Contractor during project implementation	• The ESMP will be included in the Contractors / Suppliers specification and contract. • Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions.	Funafuti	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
	National safeguard legislation not adhered to during project implementation	• Submit Preliminary Environmental Assessment Report (PEAR) to the Department of Environment in accordance with the Environment Impact Assessment Regulations and based on the final landing site selected	Funafuti	Prior to commencement of works	PIU Safeguards Advisor	Project Manager, DoE and MHARD

[10] The implementation arrangements will be clarified during the design of the PPP. Some PIU or Contractor roles may become the PPP Private Entity role.

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
		from those determined as suitable within this ESMP and the data collected for this ESMP. • Obtain permits from DoE and Kaupule (Foreshore license) prior to construction as required under EIA Regulation and Foreshore and Lands Reclamation Act. • Obtain permits from Tokelau (or other jurisdiction, pending the decision on the final connection point) for the use of the EEZ				
Design Considerations	Design fails to capture requirements of ESMP	• Only sites identified within this ESMP shall be considered for cable landing. • Design will ensure that there is no disturbance to subsistence activities such as pig farming or allotment gardening. • Design to avoid substantive terrestrial infrastructure • Ensure all requirements of ESMP are captured in design • Cable landing point to avoid disturbance of large coral assemblages on ocean side reef wall. • Fiber cable pulling to utilize existing ducts.	Funafuti	During development of feasibility study and detailed design	Private Entity Telecommunications Operator	PIU Safeguards Advisor
Physical and Ecological Environment						
Hydrothermal vents	Physical damage to vents by cable or cable laying equipment Damage to cable from 300°C vent water temperature	Construction contract specifications will stipulate cable route survey to identify sensitive ecological sea floor habitats and cable route will be planned to observe minimum clearance of 1km for identified active hydrothermal vents This route will be specified in the cable-laying specifications.	Deep sea	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
Seamounts	Physical damage to habitat and possible fishery usage from placement of cable	Construction contract specifications will stipulate cable route survey to identify sensitive ecological sea floor habitats and cable route will be planned to observe minimum clearance of 2km from base	Deep Sea and nearshore	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
		of seamount. This route will be specified in the cable-laying specifications.				
Coral Reef Communities	Destruction of coral assemblages for lagoon and ocean side landing due to failure to plan route to avoid them	For lagoon side landing point, contract specifications will instruct cable survey team to survey cable alignment at least 75m from any coral reefs or outcrops, avoiding all outcrops and following defined shipping channels.	Funafuti Lagoon	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
Coastal and Deep Ocean Habitats	Accidental discharging of pollutants from survey vessel	In bid documentation, require bidders to provide specifications of the fuel and lubricant management equipment and storage on vessels used during the survey and cable laying operations, and certify that the installation is in compliance with national regulations and/or MARPOL specifications for fuel management.	Inshore coastal areas	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
		Maintain a spill response plan to address spills and storm events and due to grounding	Inshore coastal areas	Prior to commencement of survey works	Contractor	PIU
Species potentially at risk – cetacean	Ocean sonar survey affecting cetaceans	Contract specifications to include references to best practices for operating vessels in proximity to marine mammals as included in Annex B of this ESMP.	Oceanic deep-sea areas	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
Air Quality	Green House Gases released from all vessels involved in cable contracts	In contract specifications, require all ships to submit emission certification re PM, SO2 and Nox. The results will need to meet emission standards for such vessels based on the USEPA standards (http://www.epa.gov/otaq/marine.htm CFR-40 set of codes).	Entire cable route	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor
Climate	Impact of storm and tropical cyclone events causing movement or damage to cable on reef flat and upper reef slope and damage to BMH.	Contract specifications will stipulate that for an ocean side landing, the cable will be secured in such a way as to avoid any potential damage from storm events. Specifications will also state	Landing point	During preparation of bid documents	PIU procurement team and technical advisors	PIU Safeguards Advisor

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
		that BMH design should be climate resilient and take into account future predictions for sea level and storm surge in this ESMP.				
Biosecurity	Introduction of foreign or invasive pest species from imported aggregates and equipment	Any imported aggregates and equipment will be fumigated and cleaned to GoTv Quarantine department specifications prior to shipment from home port.	Terrestrial and coastal project sites	Prior to shipment departure	Contractor	PIU Safeguards Advisor
	Introduction of invasive marine species into Tuvalu coastal waters from vessel ballast water	Contract specifications will state that survey and cable laying vessels will be required to exchange ballast water at least 5nm from the coastline.	Tuvalu territorial waters	During preparation of bid documents	PIU Procurement Team	Project Manager
Socio-Economic Environment						
Landowner Agreement	Land owners may lose access to land or assets and / or income as a result of improper or unfair land access arrangements.	Prioritize use of existing government leased lands and/or existing access easements for landing points, BMH, cable landing station construction, fiber cable network roll-out including micro-trenching, mobile radio rowers, power supply upgrades, and wi-fi access points in outer islands. Any land use agreement to be negotiated voluntarily through a lease. No compulsory acquisition/access rights will be pursued if no voluntary lease agreements are not available, and alternative sites on government owned land or in existing access easements will be used instead.	Terrestrial and coastal project site	During project design.	PIU Project Manager and Safeguards Advisor (if onboard) or CPMO E&S Advisor.	MJCFA and WB
Coastal Resource Users – subsistence and artisanal fisheries	Damage to ecosystem integrity and fishery productivity or damage to local fishing grounds (lagoon side)	For a lagoon side landing point, prepare contract specifications to avoid coral outcrops or productive fishing areas within the lagoon.	Funafuti Lagoon	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor

Access during landside trenching	Failure of contractors to plan for minimal damage and consequences of access restrictions to facilities or properties during trenching works.	Contract specifications to include instruction concerning full rehabilitation immediately after trenching is completed in one area. Develop notification protocol to provide notice of access restrictions, comprising the following steps: • Notification of the roadside properties by letter or visit providing details of the project, potential access restrictions during construction and likely timing of activities. • On-site meetings with affected parties (if requested)	Terrestrial project sites	During preparation of bid documents	PIU Procurement Team	PIU Safeguards Advisor

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
Community Engagement	Misconceptions regarding the project raising people's fears regarding project footprint and objectives	Implement the Stakeholder Engagement and Consultation Plan (Section 5 of this ESMP)	Vaiaku village and wider community	Throughout project implementation	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	MJCFA
Influx of Workers	Impacts are associated with personnel recruited from outside the local community such as increased instances of HIV/AIDs. Additionally, gender based violence (GBV) might occur as an unintended consequence of increased income through employment and / or foreign workers taking advantage of local women or children.	• Contract specifications and the bid document will provide codes of conducts and details of the required approved training along with details of approved trainers on Tuvalu as per the program developed for TvAIP. • Contract specifications with state that foreign workers are required to submit all required medical and police clearance certification as part of the Tuvalu visa application process. No person shall be exempt from this requirement.	All project sites	During development of bid documents	PIU Procurement Team	Safeguards Advisor
ESMP Implementation	Lack of technical capacity within project teams (PIU and Contractor) will likely lead to delayed or failed implementation of ESMP items.	Bid documents will specify need for experienced and qualified safeguards representative within the Contractors team. Bid documents will also stipulate minimum time inputs, presence in country and responsibilities of this role	All project sites	During development of bid documents	PIU Procurement Team	Safeguards Advisor
Public Infrastructure						
Solid Waste Management	Generation of solid waste from project activities has the potential to create an impact on the Funafuti municipal landfill which is already over burdened	The bid documentation will require the Contractor(s) to develop a Solid Waste Management Plan as part of the Method of Works Plan and following the guidelines in Annex A of this ESMP. The contractor is obligated to remove all waste from Tuvalu which produce by the project in accordance with the national law of Tuvalu (Waste Management Act 2017).	Funafuti	During development of bid documents	PIU Procurement Team	Safeguards Advisor
2. Construction Period						
Physical and Ecological Environment						

Hydrothermal Vents	Physical damage to any vents along route by the cable	As per contract specifications, lay cable along identified surveyed alignment. Maintain the specified 1km clearance from any identified active hydrothermal vents.	Along cable route	During cable laying	Contractor	PIU Safeguards Advisor

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
Sea Mounts	Physical damage to any sea mounts along the route by cable	As per contract specifications, lay cable along identified surveyed alignment. Maintain the specified 2km clearance from base of any identified seamounts	Along cable route	During cable laying operations	Contractor	PIU Safeguards Advisor
Coral Communities	Destruction of coral communities (lagoon and ocean side)	Contractor to adhere to surveyed cable route and give 75m clearance to any identified large coral outcrops or reefs.	Funafuti Lagoon	During cable laying operations	Contractor	PIU Safeguards Advisor
Landscape degradation	Foreshore degradation from any cable landing works involving heavy machinery such as excavators	• Limit foreshore work site to smallest workable area. • Clearance of any foreshore vegetation will be by hand and vegetation will be set aside for later restoration. • Once works are completed foreshore will be returned to pre-project condition or better. • Foreshore vegetation will be reinstated on completion of works. • All excess materials will be removed from foreshore and trenching route to BMH	Foreshore and route to BMH	During cable landing and connection to BMH	Contractor	PIU Safeguards Advisor
Ground water pollution	Concrete Production for new cable landing station construction.	• Concrete will be prepared on bunded and covered hard stand surface of laydown areas. • All waste water from concrete production will be collected and treated to lower the pH and allow particulates to settle out before being recycled for construction purposes. • Treated and tested waste water may be discharged for absorption into the ground. Discharge will be at a rate to allow absorption without causing surface flooding. • Slurry from concrete production will be collected and treated. Treatment can vary depending on viscosity of slurry but can include the same measures described for treating concrete waste water, or can be by	Contractors Laydown Area	During concrete production works	Contractor	PIU Safeguards Advisor

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
		facilitating the solidification of the slurry to form a gel which can be stored and disposed of according to the Solid Waste Management Plan. • Solid and cured concrete waste is considered safe to be reused by the community or the GoRMI for infrastructure maintenance. • The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete waste water or slurry.				
Laydown Site(s)	Environmental risks to ground water, coastal water and soil from poorly planned and managed construction staging and laydown site(s)	• Laydown areas will be sited on government owned land. • Areas will be securely fenced. • Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery, the preparation of concrete and the prefabrication of solar arrays. • Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding • Stock piles of sand shall not be more than 2m high, shall be bunded at the base using sandbags or similar to prevent sediment laden run off and erosion of stock piled materials. • Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Worker inductions will include a tour of the laydown area and required practices from workers.	Contractors Laydown site	Duration of works	Contractor	PIU Safeguards Advisor

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
		• Spill response kits will be available and workers trained in their use.				
Species of Interest – cetaceans	Entanglement risk for deep diving cetaceans during cable laying	Control tension of cable during laying operations so that cable conforms to undulations of seabed as per cable laying specifications and/or provide anchors if needed	Oceanic deep sea areas	During cable laying	Contractor	PIU Safeguards Advisor
	Disorientation due to sonar	Contractor to adhere to this ESMP which provides guidelines on minimally intrusive oceanographic survey methods (Annex B)	Oceanic deep-sea areas	When surveys are underway	Contractor	PIU Safeguards Advisor
Socio-Economic Environment						
Coastal Resource Users – subsistence and artisanal fisheries	Damage to local near shore fishing grounds or introduction of greater change of gear entanglement (lagoon side)	For lagoon side landing points, cable will be laid according to cable route which avoids coral outcrops or productive fishing grounds. Department of Fisheries should be requested to advise local fishers of cable laying activities, dates and avoidance measures.	Coastal areas	Cable landing	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager, Department of Fisheries
Coastal Shipping – commercial and shipping ports	Physical injury of cable by shipping (lagoon side)	Request to Department of Marine and Ports to update Funafuti Port marine chart with cable location and to declare no-anchoring zone along cable corridor	Funafuti Lagoon	During project preparation	Project Manager	MJCFA
	Disruption to shipping during cable laying	• Ensure a shipping notice is issued, warning of cable-laying, dates, and safe clearance of vessels for other activities. • Request Marine and Port Department (In Tokelau and Tuvalu) to advise local shipping of laying activities, location (planned corridor) and avoidance measures	Offshore and inshore waters of Tuvalu and Tokelau	When work is undertaken	Project Manager	MJCFA

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
Influx of Workers	Impacts are associated with personnel recruited from outside the local community such as increased instances of HIV/AIDs. Additionally, the Contractor and/or Consultants accepts that gender based violence (GBV) might occur as an unintended consequence of increased income through employment and / or foreign workers taking advantage of local women or children.	• The contractor will be responsible for ensuring that all local and foreign project staff attend training in the prevention of GBV and HIV/AIDS. Training courses have already been developed by the GoTv and will be facilitated for the Contractor by the PIU. • Project workers, project managers and the Contracting company are required to sign a code of conduct (in the bid documentation) after the training and prior to commencement of works. • Foreign workers are required to submit all required medical and police clearance certification as part of the Tuvalu visa application process. No person shall be exempt from this requirement.	Funafuti	Prior to commencement of works	Contractor / PIU	Project Manager and PIU Safeguard s Advisor
Access	Temporary loss of access to fishing grounds for local communities during laying of submarine cable.	Provision of signage at appropriate coastal locations for local communities/fishermen to be advised of construction schedule and contact person in case of inquiries.	Coastal project sites	During works	PIU Project Manager	Safeguard s Advisor
	Temporary loss of access to terrestrial facilities during trenching works.	Provision of electronic and print notices to nearby businesses, residences or facilities to notify of construction schedule and contact person in case of inquiries.	Terrestrial project sites	Prior to terrestrial works	Project Manager	Safeguard s Advisor
Occupational Health and Safety (OHS)	Health and safety risks to local contractors or local skilled labors associated with manual handling of existing buried electrical wire connections, working at heights, and other safety hazards such as being cut by sharp objects, hit by hard objects, falling into trenches, hit by passing traffic etc.	The main contractor(s) will be responsible for ensuring the safety of the local contractors engaged in the construction. The contractor(s) should prepare a Health and Safety Plan and to provide provisions of personal protection equipment (PPE) to local contractors or local skilled laborers. The main contractor shall hold regular meetings with local contractors and skilled	Cable pulling sites	Before construction & until project completion	Contractor / PIU	Project Manager and PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor TTC Project Manager for subcomponen

		labors on safety aspect topics.				t 2b activities with the support of the PIU Safeguards Advisor.
	Health and safety risks to local contractors or local skilled labors associated with the erection of mounting of poles and the installation of satellite unit, solar panels and batteries .	The contractor should prepare a Health and Safety Plan (with appropriate emergency response procedures for remote locations and working at heights) and to provide provisions of personal protection equipment (PPE) to local contractors or local skilled labors.	All terrestrial project sites	Before construction & until project completion Regular meeting with local contractors and skilled labors on safety aspect topics.	Contractor / PIU	Project Manager and PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor. TTC Project Manager for subcomponen t 2b activities with the support of the PIU Safeguards Advisor.
Contractor Capacity	A Contractor with little understanding of ESMP or safeguard matters initiates the work and causes damage, impacts and complaints	Conduct a 1 day Contractor ESMP training workshop for Contractor and PIU as part of the kick-start process on contract award. Workshop to review ESMP implementation, mitigations, monitoring and responsibilities.	Funafuti or Suva	During kick-start meetings	Project Manager and PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manage r
Public Infrastructure						
Solid Waste	Waste generated by cable laying activities, trenching, BMH and CLS	• All solid waste should be collected, handled and disposed of according to the Solid Waste Management Plan guidelines in Annex A of this ESMP and a Solid Waste Management	Funafuti	Duration of contract	Contactor	Project Manager and DWM

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
	Construction, replacement of IT equipment, and other waste will impact at local landfill facility	Plan will be developed by the Contractor as part of their MOWP. • Any e-waste and/or hazardous waste will be exported under the guidance and facilitation of the Tuvalu Department of Waste Management				
Traffic	Disruption to traffic flow around project site while works are underway.	• Haulage will be by existing roads only. • Where appropriate employ traffic control and calming measures on the road to prevent traffic accidents. The workers shall have the relevant training and safety equipment. • Speed controls shall be in place when passing through residential areas or past sensitive social receptors. • All vehicles will be well maintained and operated by experienced and licensed drivers. • Spill kits will be available on the vehicles and drivers will be trained in their use. • Any damage to road surface will be reported immediately to PIU.	Terrestrial project sites, including ancillary sites and the routes between	Duration of works	Contractor	Project Manager
3. Operational Phase						
Physical and Ecological Environment						
Impact of climate on cable	Heavy, damaging swell and waves on reef flat cause damage or movement of cable (reef flat and upper reef slope) and damage to BHM	Ongoing monitoring and inspections of cable route across reef flat and BMH for any signs of damage following storm events	Landing point	Ongoing after storm events	Private Entity Telecoms Operator	MJCFA
Socio-Economic Environment						
Vessel Activity in nearshore coastal environment	Entanglement of anchor on cable (lagoon side)	Clearly advertise location of submarine cable and alert local fishers of dangers of gear snagging.	Funafuti Lagoon	Ongoing	Department of Marine and Ports	MJCFA, Marine and Ports

Parameters	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements[10]	Who Supervises[10]
Impact associated with improved internet – better access to harmful and inappropriate content	Potential for significant societal impacts in small relatively isolated communities arising from access to internet and use of social media particularly among young people.	• Make population aware of internet site blocking features. • Provide community support and training in relation to internet use • Provide awareness programs through the primary and secondary schools in relation to social media use.	All connected areas	Ongoing	Service Provider and / or appointed NGO	MJCFA

6.3 Monitoring Plan

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
1 Design/Pre-Construction Phase						
Physical and Ecological Environment						
Hydrothermal vents	Physical damage to vents by cable or cable laying equipment Damage to cable from 300°C vent water temperature	Construction contract specifications will stipulate cable route survey to identify sensitive ecological sea floor habitats and cable route will be planned to observe minimum clearance of 1km for identified active hydrothermal vents This route will be specified in the cable-laying specifications.	One off: Routing report from cable-laying contractor identifies active and inactive hydrothermal vents and Route demonstrates 1km clearance of active vents	Prior to construction	PIU Safeguards Advisor	Project Manager
Seamounts	Physical damage to habitat and possible fishery usage from placement of cable	Construction contract specifications will stipulate cable route survey to identify sensitive ecological sea floor habitats and cable route will be planned to observe minimum clearance of 2km from base of seamount. This route will be specified in the cable-laying specifications.	One off: Routing report from cable-laying contractor identifies sea mounts and route demonstrations 2km Clearance of sea mounts base	Prior to construction	PIU Safeguards Advisor	Project Manager
Coral Reef Communities	Destruction of coral assemblages for lagoon side landing due to failure to plan route to avoid them	For lagoon side landing point, contract specifications will instruct cable survey team to survey cable alignment at least 75m from any coral reefs or outcrops, avoiding all outcrops and following defined shipping channels.	One off: Routing report from cable-laying contractor identifies coral outcrops and Communities in the Funafuti lagoon for lagoon side landing and route demonstrates 75m or greater clearance of these habitats	Prior to construction	PIU Safeguards Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
Coastal and Deep Ocean Habitats	Accidental discharging of pollutants from survey vessel	• In bid documentation, require bidders to provide specifications of the fuel and lubricant management equipment and storage on vessels used during the survey and cable laying operations, and certify that the installation is in compliance with national regulations and/or MARPOL specifications for fuel management. • Bid document will require that contractor maintain a spill response plan to address spills and storm events and due to grounding	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation.	PIU Safeguards Advisor	Project Manager
Species potentially at risk – cetacean	Ocean sonar survey affecting cetaceans	Contract specifications to include references to best practices for operating vessels in proximity to marine mammals as included in Annex B of this ESMP.	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation	PIU Safeguards Advisor	Project Manager
Air Quality	Green House Gases released from all vessels involved in cable contracts	In contract specifications, require all ships to submit emission certification re PM, SO2 and Nox. The results will need to meet emission standards for such vessels based on the USEPA standards (http://www.epa.gov/otaq/marine.htm CFR-40 set of codes).	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation.	PIU Safeguards Advisor	Project Manager
Climate	Impact of storm and tropical cyclone events causing movement or damage to cable on reef flat and upper reef slope and damage to BMH.	Contract specifications will stipulate that for an ocean side landing, the cable will be secured in such a way as to avoid any potential damage from storm events. Specifications will also state that BMH design should be climate resilient and take into account future predictions for climate change in this ESMP.	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation	PIU Safeguards Advisor	Project Manager
Biosecurity	Introduction of foreign or invasive pest species from imported aggregates and equipment	Any imported aggregates and equipment will be fumigated and cleaned to GoTv Quarantine department specifications prior to shipment from home port.	One off: Inspection of Tuvalu customs and quarantine certifications	Prior to release from Funafuti Port	PIU Safeguards Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
	Introduction of invasive marine species into Tuvalu coastal waters from vessel ballast water	Contract specifications will state that survey and cable laying vessels will be required to exchange ballast water at least 5nm from the coastline.	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender documents	PIU Safeguards Advisor	Project Manager
Socio-Economic Environment						
Landowner Agreement	Project implementation could be hampered by unsatisfactory outcome of negotiations with any non-government leased land owners	Prioritize use of existing government leased lands for landing points, BMH cable landing station construction, fiber cable network roll-out including micro-trenching, mobile radio rowers, power supply upgrades, and wi-fi access points in outer islands. No private land to be acquired for this project.	One-off: signed agreement in place between MJCFA and any private land owners for either permanent or temporary access to land. Agreement must detail the financial arrangements	Prior to start of works	PIU Project Manager or PIU Safeguards Advisor (if onboard)	MJCFA
Coastal Resource Users – subsistence and artisanal fisheries	Damage to ecosystem integrity and fishery productivity or damage to local fishing grounds (lagoon side)	For a lagoon side landing point, prepare contract specifications to avoid coral outcrops or productive fishing areas within the lagoon.	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation	PIU Safeguards Advisor	Project Manager
Access during landside trenching	Failure of contractors to plan for minimal damage and consequences of access restrictions to facilities or properties during trenching works.	Contract specifications to include instruction concerning full rehabilitation immediately after trenching is completed in one area. Develop notification protocol to provide notice of access restrictions, comprising the following steps: • Notification of the roadside properties by letter providing details of the project, potential access restrictions during construction and likely timing of activities. • On-site meetings with affected parties (if requested)	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation	PIU Safeguards Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
Community Engagement	Misconceptions regarding the project raising people's fears regarding project footprint and objectives	Implement the Stakeholder Engagement and Consultation Plan (Section 5 of this ESMP)	Monthly: SECP is implemented and minutes of each meeting recorded	As per schedule in SECP	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
Influx of Workers	Impacts are associated with personnel recruited from outside the local community such as increased instances of HIV/AIDs. Additionally, gender based violence (GBV) might occur as an unintended consequence of increased income through employment and / or foreign workers taking advantage of local women or children.	• Contract specifications and the bid document will provide codes of conducts and details of the required approved training along with details of approved trainers on Tuvalu as per the program developed for TvAIP. • Contract specifications with state that foreign workers are required to submit all required medical and police clearance certification as part of the Tuvalu visa application process. No person shall be exempt from this requirement.	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
ESMP Implementation	Lack of technical capacity within project teams (PIU and Contractor) will likely lead to delayed or failed implementation of ESMP items.	Bid documents will specify the need for experienced and qualified safeguards representative within the Contractors team. Bid documents will also stipulate minimum time inputs, presence in country and responsibilities of this role	One off: Confirm that contractor's bid contains suitable response to the bid documents.	Tender evaluation	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
Public Infrastructure						
Solid Waste Management	Generation of solid waste from project activities has the	The bid documentation will require the Contractor to develop a Solid Waste Management	Solid Waste Management Plan approved by PIU	Prior to establishment of laydown site	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
	potential to create an impact on the Funafuti municipal landfill which is already over burdened	Plan as part of the Method of Works Plan and following the guidelines in Annex A of this ESMP				
2. Construction Period						
Physical and Ecological Environment						
Hydrothermal Vents	Physical damage to any vents along route by the cable	As per contract specifications, lay cable along identified surveyed alignment. Maintain the specified 1km clearance from any identified active hydrothermal vents.	As needed: If hydrothermal vents are detected during initial ocean survey, periodically check on cable location to be sure it is in compliance with the defined limits	During placement of cable	PIU Safeguards Advisor	Project Manager
Sea Mounts	Physical damage to any sea mounts along the route by cable	As per contract specifications, lay cable along identified surveyed alignment. Maintain the specified 2km clearance from base of any identified seamounts	As needed: If seamounts are detected during initial ocean survey, periodically check on cable location to be sure it is in compliance with the defined limits	During placement of cable	PIU Safeguards Advisor	Project Manager
Coral Communities	Destruction of coral communities (lagoon side)	Contractor to adhere to surveyed cable route and give 75m clearance to any coral outcrops or reefs.	As needed: if lagoon side landing site is selected inspect cable laying operations in vicinity of coral formations and confirm compliance	During placement of cable within Funafuti lagoon	PIU Safeguards Advisor	Project Manager
Landscape degradation	Foreshore degradation from any cable landing works involving heavy machinery such as excavators	• Limit foreshore work site to smallest workable area. • Clearance of any foreshore vegetation will be by hand and vegetation will be set aside for later restoration.	One off prior to landing: ensure machinery work site is clearly defined and marked. Ensure necessary foreshore	Cable landing operations	PIU Safeguards Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
		• Once works are completed foreshore will be returned to pre-project condition or better. • Foreshore vegetation will be reinstated on completion of works. • All excess materials will be removed from foreshore and trenching route to BMH	vegetation has been removed and retained. One off after landing: foreshore and route to BMH has been restored to pre-construction condition and foreshore vegetation replanted			
Ground water pollution	Concrete Production for new cable landing station construction.	• Concrete will be prepared on bunded and covered hard stand surface of laydown areas. • All waste water from concrete production will be collected and treated to lower the pH and allow particulates to settle out before being recycled for construction purposes. • Treated and tested waste water may be discharged for absorption into the ground. Discharge will be at a rate to allow absorption without causing surface flooding. • Slurry from concrete production will be collected and treated. Treatment can vary depending on viscosity of slurry but can include the same measures described for treating concrete waste water, or can be by facilitating the solidification of the slurry to form a gel which can be stored and disposed of according to the Solid Waste Management Plan. • Solid and cured concrete waste is considered safe to be reused by the community or the GoRMI for infrastructure maintenance. • The Contractor's will have a spill response plan in place to manage accidental spills or leakages of concrete waste water or slurry.	One off: all mitigating provisions are in place	Prior to commencement of concrete production	PIU Safeguards Advisor	Project Manager
			Weekly: concrete production is occurring at designated area, water catchment and treatment systems are functional	During concrete production works	PIU Safeguards Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
Laydown Site(s)	Environmental risks to ground water, coastal water and soil from poorly planned and managed construction staging and laydown site(s)	• Laydown areas will be sited on government owned land. • Areas will be securely fenced. • Bunded and covered areas will be installed for the storage and handling of hazardous materials and/or substances, the wash down of machinery, the preparation of concrete and the prefabrication of solar arrays. • Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding • Stock piles of sand shall not be more than 2m high, shall be bunded at the base using sandbags or similar to prevent sediment laden run off and erosion of stock piled materials. • Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Worker inductions will include a tour of the laydown area and required practices from workers. • Spill response kits will be available, and workers trained in their use.	One off: All mitigation measures are in place Record of attendance to induction training for all workers	Prior to commencement of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
			Weekly: all mitigation measures are in place and functional as per ESMP Testing results from waste water included in Contractors reports	Duration of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
Species of Interest – cetaceans	Entanglement risk for deep diving cetaceans during cable laying	Control tension of cable during laying operations so that cable conforms to undulations of seabed as per cable laying specifications and/or provide anchors if needed	Daily: cable tension is being correctly managed according to contract specification	During placement of cable	PIU Safeguards Advisor	Project Manager
	Disorientation due to sonar	Contractor to adhere to this ESMP which provides guidelines on minimally intrusive oceanographic survey methods (Annex B)	Daily: Dedicated personnel on cable laying vessel reporting	During use of sonar	PIU Safeguards Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
			any sightings of cetaceans within 1km of vessel and suspension of sonar works until cetacean has moved away			
Socio-Economic Environment						
Coastal Resource Users – subsistence and artisanal fisheries	Damage to local near shore fishing grounds or introduction of greater change of gear entanglement (lagoon side)	For lagoon side landing points, cable will be laid according to cable route which avoids coral outcrops or productive fishing grounds. Department of Fisheries should be requested to advise local fishers of cable laying activities, dates and avoidance measures.	Daily: for Funafuti lagoon, cable is placed, and trenching works are progressing according to technical specifications.	During works within Funafuti Lagoon	PIU Safeguards Advisor	Project Manager and Department of Fisheries
Coastal Shipping – commercial and shipping ports	Physical injury of cable by shipping (lagoon side)	Request to Department of Marine and Ports to update Funafuti Port marine chart with cable location and to declare no-anchoring zone along cable corridor	One off: documentation of request to Marine and Ports	Prior to commencement of works	Project Manager	MJCFA
	Disruption to shipping during cable laying	• Ensure a shipping notice is issued, warning of cable-laying, dates, and safe clearance of vessels for other activities. • Request Marine and Port Department (In Tokelau and Tuvalu) to advise local shipping of laying activities, location (planned corridor) and avoidance measures	One off: shipping (local and international) notices(s) issued. Appropriate markers and signage employed	Prior to cable laying works	PIU	Project Manager
Influx of Workers	Impacts are associated with personnel recruited from outside the local community such as increased instances of HIV/AIDs. Additionally, the	• The contractor will be responsible for ensuring that all local and foreign project staff attend training for prevention of GBV and HIV/AIDS. Training courses have already been developed by the GoTv and will be facilitated for the Contractor by the PIU.	One-off: Codes of Conduct signed by all workers. All workers recorded on training attendance sheets.	Prior to commencement of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
	Contractor and/or Consultants accepts that gender based violence (GBV) might occur as an unintended consequence of increased income through employment and / or foreign workers taking advantage of local women or children.	• Project workers, project managers and the Contracting company are required to sign a code of conduct (in the bid documentation) after the training and prior to commencement of works. • Foreign workers are required to submit all required medical and police clearance certification as part of the Tuvalu visa application process. No person shall be exempt from this requirement.	All foreign workers have submitted copies of medical form and police clearance to Tuvalu immigration and have visas in their passports			
Access	Temporary loss of access to fishing grounds for local communities during laying of submarine cable (1-2 days).	Provision of signage at appropriate coastal locations for local communities/fishermen to be advised of construction schedule and contact person in case of inquiries.	One off: Inspect content and placement of signage	Prior to commencement of subject works	PIU Safeguards Advisor	Project Manager
	Temporary loss of access to terrestrial facilities during trenching works (<1 week).	Provision of electronic and print notices to nearby businesses, residences or facilities to notify of construction schedule and contact person in case of inquiries.	One off: Inspect material distributed and confirm timely distribution	Prior to commencement of trenching works	PIU Safeguards Advisor	Project Manager
Occupational Health and Safety (OHS)	Health and safety risks to local contractors or local skilled labors associated with manual handling of existing buried electrical wire connections and other safety hazards such as cut by sharp objects, hit by hard object, falling into trenches,	The main contractor will be responsible for ensuring the safety of the local contractors engaged in the construction. The contractor should prepare a Health and Safety Plan and to provide provisions of personal protection equipment (PPE) to local contractors or local skilled laborers. Regular meeting with local contractors and skilled labors on safety aspect topics.	Weekly: all mitigation measures are in place and functional as per ESMP	Duration of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor. TTC Project Manager for subcomponent 2b activities with the support of the PIU Safeguards Advisor.	Project Manager

	hit by passing traffic.					
	Health and safety risks to local contractors or local skilled labors associated with the erection of mounting of poles and the installation of satellite unit, solar panels and batteries (working at height etc.)	The contractor should prepare a Health and Safety Plan (with appropriate emergency response procedures for remote locations) and to provide provisions of personal protection equipment (PPE) to local contractors or local skilled labors.	Weekly: all mitigation measures are in place and functional as per ESMP	Duration of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor. TTC Project Manager for subcomponent 2b activities with the support of the PIU Safeguards Advisor.	Project Manager
Contractor Capacity	A Contractor with little understanding of ESMP or safeguard matters initiates the work and causes damage, impacts and complaints	Conduct a 1 day Contractor ESMP training workshop for Contractor and PIU as part of the kick-start process on contract award. Workshop to review ESMP implementation, mitigations, monitoring and responsibilities.	One off: Review training materials and attendance records	Prior to commencement of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
Public Infrastructure						

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
Solid Waste	Waste generated by cable laying activities, trenching, BMH and CLS construction and other waste will impact at local landfill facility	• All solid waste should be collected, handled and disposed of according to the Solid Waste Management Plan guidelines in Annex A of this ESMP and a Solid Waste Management Plan will be developed by the Contractor(s) as part of their MOWP. • Any hazardous waste will be exported under the guidance and facilitation of the Tuvalu Department of Waste Management	Weekly: all provisions of the Approved Solid Waste Management Plan effectively implemented Waste collection at laydown area is secure, well signed and clean Hazardous waste is stored according to SWMP Good housekeeping around project sites All waste is disposed of offshore	Duration of Works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
Traffic	Disruption to traffic flow around project site while works are underway.	• Haulage will be by existing roads only. • Where appropriate employ traffic control measures on the road to prevent traffic accidents. The workers shall have the relevant training and safety equipment. • Speed controls shall be in place when passing through residential areas or past sensitive social receptors. • All vehicles will be well maintained and operated by experienced and licensed drivers. • Spill kits will be available on the vehicles and drivers will be trained in their use. • Any damage to road surface will be reported immediately to PIU.	Weekly: Any complaints received regarding project traffic Signs and fences restrict or direct pedestrians and public where appropriate. All vehicles in good working order Any reports of damage to public roads.	Duration of works	PIU Safeguards Advisor (if onboard) or CPMO E&S Advisor	Project Manager
3. Operational Phase						
Physical and Ecological Environment						
Impact of climate on cable	Heavy, damaging swell and waves on reef flat cause damage or	Ongoing monitoring and inspections of cable route across reef flat and BMH for any signs of damage following storm events	Post-storm: Damage to cable protection and	Ongoing	Private Entity Telecommunications Operator	MJCFA

Parameters	Significant Potential Impacts	Mitigation Measures	Monitoring / Frequency	When	Implementing	Supervision
	movement of cable (reef flat and upper reef slope) and damage to BHM		damage to BMH. Loss of internet connection			
Socio-Economic Environment						
Vessel activity in nearshore coastal environment	Entanglement of anchor on cable (lagoon side)	Clearly advertise location of submarine cable and alert local fishers of dangers of gear snagging.	One off: Confirm with fishers that necessary information was distributed	On handover of cable	Private Entity Telecommunications Operator	MJCFA
Impact associated with improved internet – better access to harmful and inappropriate content	Potential for significant societal impacts in small relatively isolated communities arising from access to internet and use of social media particularly among young people.	• Make the population aware of internet site blocking features. • Provide community support and training in relation to internet use • Provide awareness programs through the primary and secondary schools in relation to social media use.	Ongoing: Recommended actions are implemented Consultations with church and school leaders to identify are areas of concern regarding the youth and social media use	Ongoing	Director ICT, Director of Education and Kaupule	MJCFA and Ministry of Education

6.4 Technical Assistance and Sector Reform Review

Any development of these items through TvICT will follow the SECP and safeguards policies described in this ESMP to ensure that all affected parties are engaged in the process of development and that broader impacts on gender, environment, etc. are considered.

For all technical assistance consultants (for Funafuti and the Outer Islands), this ESMP will be included in the TOR and final contract. For the preparation of the Public Private Partnership (subcomponent 2a), the Safeguards Advisor will ensure the partnership bid documents / partnership agreement / contract includes the provisions of the ESMP in Section 6.2 and that the entity will have an Environmental and Social Specialist contracted to ensure they comply with the ESMP in their operations under the project.

In addition to specialist safeguards input into the development of the agreements, it may be necessary for a safeguard specialist to provide expertise on integrating the safeguard requirements of the ESMP into the PPP implementation arrangements.

The institutional review of the Sector should include the requirement to conduct a capacity needs assessment for environmental and social safeguard operational management of the MJCFA and the regulator. This should particularly focus on the social implications of better internet connection for the youth or vulnerable persons in today's social media driven culture and the roles and responsibilities of the various agencies.

It should be considered that the sector review should also design and conduct a training program on raising consumer and community awareness of the risks from accessing inappropriate materials and from social issues such as online bullying and sexual grooming.

6.5 Outer Island Infrastructure and Connectivity Strategy

The development of the infrastructure and connectivity strategy may include options for maintenance or improvement of infrastructure on each island for access to improved ICT services via satellite sub- stations.

Initial expectations are that this will just require small scale installations within the government leased TTC compounds on each of the island and will be work undertaken by Private Entity Telecommunications Operator or TTC employees and technicians. It is not currently expected that the outer island will receive fibre optic cables and therefore this ESMP can be used to manage the environmental and social risks of small scale installations works.

This ESMP is not applicable to outer island solutions with a higher level of risk such as delivery and landing of equipment and materials via any other vessel than the inter-island ferry or any extension of the fibre optic cable beyond Funafuti. For any outer island solutions greater in scope than the installation of equipment in existing TTC compounds by TTC employees or the Private Entity Telecommunications Operator, a new ESMP will be developed, consulted on and disclosed.

6.5.1 Outer Island Screening

For the small scale outer island works described above, as well as the general provisions in this ESMP, additional screening has been undertaken to identify any additional risks and the limitations of this ESMP in its ability to mitigate for those risks.

SITE SELECTION AND LAND AVAILABILITY AND LAND ACQUISITION: It is anticipated that all works will take place within the existing TTC compounds on the outer islands. No additional land will be required

for the project and no resettlement will be permitted or undertaken.

LABOUR WORKFORCE: Accommodation and resources on outer islands are limited which has implications for projects with a relatively high workforce. The expected investments in the outer island under this project require a very small workforce which is likely to be TTC or Private Entity Telecommunications Operator employees and potentially a few local island residents. Therefore, no risk is identified relating to the workforce.

VISUAL AMENITY CONSIDERATIONS: These effects vary according to the scale, height and design of the facility and the immediate environment within which they are located. Generally, the following principles should be applied:

- Co-location (sharing) of any existing masts, poles, or towers is to be encouraged;
- Co-siting on existing sites is preferred to the proliferation of new sites;
- In urban locations mounting antennae on buildings is preferred to new mast, pole or tower installations wherever possible;
- Sites with access from existing roads or tracks are preferred over sites requiring new roads or tracks to be constructed with extensive vegetation clearance;
- Vegetation removal should be the minimum required for installation and replanting around installations is required;
- Mast, pole and tower heights should be the minimum to achieve a balance between network coverage and the number of sites. Generally, heights up to lower than 150m (ICAO standards Annex 14 chapter 4.3.2) will be permitted.
- Additional justification will be required for heights in excess of this. Obtaining clearance above surrounding vegetation/trees will be considered as a reasonable justification.
- Masts, poles, towers and antennae shall be constructed in recessive coloured materials designed to blend in with surrounding vegetation or development.
- Equipment cabinets shall be similar recessive colours and shall be sited as close to the mast, pole or tower base as reasonably practical
- Electricity supply to sites should be underground whenever possible

LANDING OF EQUIPMENT: for any bulky equipment it may not be possible to land it via the inter-island ferry. If this is the case, the offloading on the outer island may need more environmentally damaging methods such as landing of the equipment on the reef crest and cartage over the reef flats and/or beaches. There is an associated environmental impact on the coral reef ecosystems in the landing areas. Therefore, for any bulky equipment landing a new ESMP based on the contents of this ESMP will be required.

ALTERNATIVE SOLUTIONS: At this stage it is expected that outer island solutions will provide for connection via satellite to the Funafuti cable. This ESMP does not provide for other solutions such as an extension of the fibre optic cable to the outer island. Should this be a recommendation of the strategy, a new ESMP will be required.

6.5.2 ESMP Implementation for Outer Islands

There are three implementation mechanisms for this ESMP for any future outer island telecommunications projects as defined above:

- Use of the ESMP is specified in the Terms of Reference for the Technical Assistance for development of the outer island strategy. Specific ESHS measures will be stated in the ESMP should also be incorporated in the procurement document;

- Use of the ESMP is specified in the procurement and contractual documents for any Contractors or partnership agreement. The relevant suggested specifications in the ESMP mitigation tables should also be incorporated in the technical specifications;
- Environmental permits and development consents are granted with the condition that works proceed under the provisions of the ESMP.

7 Roles & Responsibility

The agencies with important responsibilities for ESMP implementation, monitoring and reporting are MoF, MJCFA (Task Force and PIU), TTC, the PPP Private Entity and the Contractor(s). Details of the roles assigned to various agencies / organizations are below –

7.1 National Project Committee

MJCFA will chair the national project committee and will work with national government entities, the new entrant/private partner into the national telecommunications market (when identified) to advise them on the national arrangements and management of the TvICT work.

7.2 MOF

The Ministry of Finance holds overall responsibility for ensuring that the WB safeguard requirements are adhered to as part of the financing agreement. The CPMO is an agency under the MOF and was established on June 1, 2021 by the GoTv with the main task of overseeing the WB-funded program in Tuvalu. The Director of CPMO will be the Project Manager for the ICT project for the subcomponent 2b “quick wins” or until the next restructuring. The PIU Safeguards Advisor will support the implementation and monitoring of the ESMP update.

7.3 Project Implementation Unit under MJCFA

A Project Implementation Unit (PIU) will be established within MJCFA and it will include a Project Manager, a Project Accountant, a part time Safeguards Advisor and a Procurement Specialist. Additional resources will be used from the TvAIP PIU to support the TvICT PIU for financial management and procurement. The PIU will maintain responsibility for the implementation of the ESMP and supervision of safeguards aspects of technical advisory and physical works for the duration of the project. Some roles may be delegated to the Private Entity Telecommunications Operator, depending on the final implementation arrangements for the procurement and oversight of the cable installation and terrestrial works.

The PIU Safeguards Advisor will be an experienced consultant and will have the responsibility to oversee the implementation of the ESMP and their responsibilities include, but are not limited to:

- Ensuring the ESMP is followed for technical advisory under Component 1, including the upstream work on developing the Public Private Partnership and route selection and optimisation and the design phase of subcomponent 2a.
- Supervising and monitoring the Private Entity Telecommunications Operator and the Contractor as per the requirements of the ESMP Monitoring Plan for compliance with the ESMP
- Manage instances of Contractor non-compliance and GRM responses
- Integrate ESMP into all relevant contractual and procurement documents for Contractor and/or private partners and reviewing bids and draft contracts, CVs of personnel or consultants and providing feedback to the PIU.
- Applying for all approvals and permits.
- Implementing the Stakeholder Engagement and Consultation Plan with meaningful input from

the Private Entity Telecommunications Operator.

- Providing monthly reporting to the PIU Project Manager on all aspects of safeguards compliance of the projects including results of scheduled reporting, any instances of non-compliance, any environmental incidents and any GRM submission/responses.
- Conduct training for Contractors.
- Manage the GRM.

The PIU Project Manager will be responsible for overall project coordination and technical guidance and will support the procurement of various packages and studies. Technical staff will be recruited as necessary to support the implementation of technical advisory components.

A locally based community liaison officer or safeguards administration officer may be recruited if necessary to support the PIU during busy periods such as consultations or construction monitoring.

7.4 TTC

TTC Project Manager will be responsible for implementing the relevant sections of the ESMP for any activities that they deliver under sub component 2b, with the support of the PIU Safeguards Advisor.

7.5 Technical Advisors / Consultants

All technical advisors are required to comply with the ESMP and Safeguards Policy more broadly in terms of the work methodologies and outputs. They will be required to work with the PIU to ensure adequate citizen and stakeholder engagement in their work programme.

7.6 Private Entity Telecommunications Operator

As the entity responsible for design, installation and operation of the cable and network (subcomponent 2a), the Private Entity will be required to:

- Comply with the ESMP and the WB Safeguards Policies.
- Provide a qualified and experienced Heath, Safety and Environment Officer or Consultant to oversee implementation of their roles and responsibilities under the ESMP;
- Seek specialist safeguard advise on how to integrate the requirements of the ESMP into the PPP implementation arrangements;
- Supervise Contractor's ESMP implementation to supplement the PIU supervision responsibilities;
- Provide meaningful input to any consultations required for the project as directed by the PIU;
- Report progress on safeguards on a regular basis. Report all environmental and OHS incidents and non-compliances, to the PIU Safeguards Advisor for any action;
- Resolve conflicts and grievances under their responsibility and report all complaints and grievances received to the PIU in their monthly reports, along with progress on close out for each one.

7.7 Contractors

Contractors will be required for terrestrial civil works and submarine cable installation. It is the Contractors' responsibility to:

- Provide a qualified and experienced Heath, Safety and Environment Officer or Consultant to oversee implementation of their roles and responsibilities under the ESMP;

- Prepare and have cleared by the appropriate project supervising body any Management Plans required for the contract under this ESMP;
- Carry out contracted works in accordance with this ESMP and any required Management Plans;
- Conduct daily and weekly safeguard inspections to ensure compliance with this ESMP and report the results to the PIU Safeguards Advisor;
- Provide meaningful input to any consultations required for the project;
- Report all environmental and OHS incidents and non-compliances to the PIU Safeguards Advisor for any action; Resolve conflicts and grievances under their responsibility and report all complaints and grievances received to the PIU in their monthly reports, along with progress on close out for each one.

8 Capacity Development & Training

8.1 Capacity Development

MJCFA has no inhouse safeguards specialists, therefore MJCFA will recruit a part time experienced safeguards advisor to the TvICT PIU to fill this capacity gap.

8.2 Training

The TvICT PIU will require training to ensure effective implementation and oversight of the ESMP. Areas recommended for PIU training include the following –

- WB's Safeguards Policies, in particular those triggered and relevant to the Project;
- Roles and responsibilities of different key agencies in safeguards implementation;
- How to effectively integrate the ESMP into project management, implementation, monitoring and reporting;
- Management of the GRM;
- How to facilitate meaningful community consultations;
- Integration of the ESMP and safeguard specific clauses into the contract and bid documentation.

Training in the above areas is recommended to be held within three (3) months of the Safeguards Advisor being recruited and no more than (6) months from project effectiveness.

On-going support will be provided by the WB Task Team for the duration of the project.

Private Sector Partner

The private sector partner will be expected to bring to the partnership satisfactory resources to comply with the ESMP and WB safeguards policies, manage the Contractor's compliance with the ESMP, and build capacity with their Tuvaluan Partners for ongoing management of safeguards issues once the project has been completed.

9 Budget

The following is an approximate budget for implementing the EMSP in Section 6. These items are over and above those considered to be covered by normal operations.

Table 8: Indicative Budget for ESMP Implementation

Budget Item	**Detail**	**Timeframe**	**Cost Estimate (AUD)**
	Component 1, 2 and 3		
Stakeholder consultations	Catering, venue hire, media, materials, travel and accommodation, translation and interpretation services, etc.	Full project cycle	13,500
Engagement of part time Safeguards Advisor	Travel costs, remote and in-country support.	Full project cycle	120,000
Institutional Training	Venue, stationery, refreshments, training materials		2,000
HIV/GBV Training	Costs of training by local organisations		2,000
Disclosure of safeguards instruments and consultation materials and GRM materials	Translation, report production, distribution		5,500
Monitoring and reporting	Report production costs (non-staff costs);		2,000
	Estimated Total Budget		**145,000**

Annex A: Solid Waste Management Plan

These requirements will form the basis for the Contractors management of their solid waste during construction. This SWMP satisfies:

1. The Tuvalu Integrated Waste Policy and Management Plan;
2. The requirements of this ESMP;
3. The requirements of the World Bank
4. Meets the following minimum standards:
   i. No Tuvalu landfills are to be used for any waste. All waste is to be recycled or disposed of offshore at a permitted facility.
   ii. No dumping or storage of any waste in Tuvalu or in any other location except as provided in this ESMP.
   iii. Compliance with Waigani Convention and any other relevant international conventions for export of hazardous and non-hazardous waste.
   iv. Identify and utilise suitable local recycling and reuse options.
5. Requires the Contractor to meet the usual good practice of solid waste management, including:
   i. Segregation of waste
   ii. Secure storage for waste
   iii. Adopting the waste hierarchy: (i) avoid; (ii) reduce; (iii) reuse; (iv) recycle
   iv. Collaborating with other sectors, waste generators and government initiatives for cumulative benefits

DISPOSAL PROTOCOLS

The follow disposal methods will be used for all generated project solid waste streams:

Waste Stream	Disposal Method	Responsible Agency
General Waste (not including reusable, recyclable or organic materials)	Offshore in permitted landfill. The Funafuti Landfill will not be used for any project waste	Contractor
Organic or compostable Waste	Disposed of at the SWA composting site with approval of SWA	Contractor in consultation with SWA
Recyclable waste	Recyclable metals will be disposed offshore/overseas recycling manufacturer under the contractor's expenses.	Contractor in consultation with SWA

	For other recyclable waste, the Contractor will consult with SWA to determine whether their preference is to receive that waste into their recycling program or to recommend the Contractor remove it offshore at an approved facility.	
Reusable waste (excess materials or clean fill)	Excess materials will be provided to SWA to assist with their management of the Funafuti Landfill. Other reusable waste will be offered to the Public Works Department and the community.	Contractor in consultation with SWA, PWD and Kaupule
Hazardous materials (spent lubricant, spill contaminate, fuel)	To be disposed of offshore under the condition of the Waigani convention. Contractor is to use the Solid Waste Agency of Tuvalu to facilitate the export of hazardous waste. The SWA will store the waste at their compound and organise all export paperwork	Contractor in consultation with SWA

Implementation of SWMP

1. Collection and Storage: The Contractor will provide dedicated and clearly marked areas at their laydown site for storage of waste prior to their disposal offshore. Hazardous waste will be promptly delivered to the SWA depot but for any time it is stored at the laydown site, it will be in compliance with the ESMP in covered watertight areas.
2. On-site: The Contractor will ensure that all employees understand how the waste management system (housekeeping, sorting and storage) will work on-site, including bin placement and access.
3. Disposal: The Contractor will enusre project waste is to be dispose offshore. No project waste is dump at Funafuti land
4. Clearly assign and communicate responsibilities: ensure those involved in the project are aware of their responsibilities in relation to the SWMP.
5. Training: be clear about how the various elements of the SWMP will be implemented.
6. Monitor: to ensure the plan is being implemented, monitor on-site as per the ESMP monitoring plan.

Annex B: Cetacean Species Protection Protocols

The following guidelines are to be followed by the crew of the cable vessel, survey vessel and support boat(s) during the installation of the Tuvalu fibre optic cable in for operations in Tuvaluan, Tokelauan and international waters. These guidelines are intended to establish awareness of the potential for contact with cetacean (whales and dolphins), and actions for avoiding contact during the installation or surveying activities. In addition, procedures for reporting incidents involving marine mammals are described below.

These guidelines are based on protocols used by observers during cable installations and inspection surveys conducted in California.[11]

These guidelines are to be carried out to the extent feasible by the ship's personnel and onboard representative, giving first priority to the safety of the vessel and crew.

A look-out for cetaceans shall be included with the normal lookout duties of the vessel's bridge personnel, provided this does not interfere with the safe operation of the vessel. Maintain a log of sightings, noting date, time, coordinates, and approximate distance of the animal from the ship. The log shall be turned in daily. If contact with a marine mammal appears likely, the vessel speed should be reduced as soon as possible.

If a mammal approaches the cable lay operation, slack should be taken out of the cable to reduce the amount of cable in the water column. If it is safe to do so, the ship should be allowed to drift.
In the unlikely event of contact between a marine mammal and the vessel, the following actions should be taken (if it is safe to do so)

Cable Laying Operations Protocol:

i. Contact the onboard representative immediately;
ii. Log all information related to the incident (see attached log) and report the incident to the PIU Project Manager for reporting to the Tuvalu or Tokelau Department of Environment. Contact with marine mammals MUST BE REPORTED in any circumstance.
iii. Await instructions from the contracted representative.
iv. Record all information related to the incident, with photographs if applicable, and submit with the daily report to the onboard representative.

Sonar Survey Operations Protocol:

a. General
   i. The minimum source level required to achieve results should be used and frequencies chosen to minimize impacts on marine mammals.
   ii. Continuous noise is likely to be more damaging to marine mammals than pulsed sounds and should be avoided where possible.
   iii. Experienced Marine Mammal Observers (MMOs) must be present on board all vessels conducting seismic (including boomers) or electromagnetic surveys at all times during the survey.

[11] The protocols were originally developed by the Marine Mammal Consulting Group in Santa Barbara, California, and approved by US state and federal agencies with authority for overseeing the activity.

iv. The MMO must use a distance measuring stick, reticle telescope or binoculars to ascertain distances to marine mammals.
v. The MMO must submit copies of the reporting template as outlined at the end of these guidelines and must submit this report to the PIU Safeguards Advisor.
vi. The vessel operator must provide a report (including a daily log) on the operation of the seismic equipment that will indicate the soft starts and their duration to the MMO.

b. Multibeam and side-scan sonar surveys: Pre-Start Scan for Marine Mammals
i. If survey work is to be conducted in sheltered and enclosed waters, survey work must start at the inner most part of the bay, inlet or estuary to be surveyed and work outwards. This is to ensure that cetaceans are not driven into an enclosed area, which could cause them to panic.
ii. MMOs should survey the area for the presence of cetaceans 30 minutes before the starting of operations.
iii. A minimum distance of 1000 metres is required between the centre of the array/sound source and the nearest cetacean before starting.
iv. If marine mammals are seen within 1000 metres of the centre of the sound source the start of the sound source(s) should be delayed until they have moved away, allowing adequate time after the last sighting for the animals to leave the area (30 minutes).
v. If the cetaceans do not leave the area it is recommended that the survey vessel alter course to ensure that the animals are outside the 1000 metres exclusion zone when soft start commences.

c. Multibeam and side-scan sonar survey: Soft-start procedures for
i. The sound level must be allowed to gradually build over a period of 20 minutes; where this is not possible, the equipment should be turned on and off over a 20 minute period to act as a warning signal and allow cetaceans to move away from the sound source.
ii. Multibeam or side-scan sonar start-up must occur during daylight hours when MMO's can carry out the required start-up procedure.
iii. The start-up procedure should be implemented at all times including during testing of the sound source.
iv. If, for any reason, the sound source is stopped and not restarted for at least 5 minutes a full start-up procedure should be carried out.
v. Once the sound source has achieved its maximum output the survey need not be halted if cetaceans approach the vessel.

If turn-around time between sample lines or stations is greater than the time required to conduct a start-up procedure (30 minutes), then the sound source should be stopped and a full start-up procedure should be used prior to commencing the new line.

Annex C: Consultation Workshop Report

Public Consultation Report

Telecommunications and ICT Development Project (TvICT)

12th September 2018

TuFHA Conference Room

I. Introduction

a. Tuvalu is one of the least connected countries in the Pacific region today. Information Communication Technology (ICT) services are costly, of limited variety and variable quality. Services are particularly limited outside the main island of Funafuti. This situation limits communications between households, in particular with overseas relatives, and also increases the cost of doing business and delivery of services. Beyond the personal level, the lack of ICT services constrains business development, tourism, and management of natural disasters. It is particularly a constraint on social services such as education, and healthcare; the lack of air transport to any of the outer islands makes first action medical care and advice from remote specialists very important but presently unavailable. In this context, this ICT Project proposes to support Tuvalu in developing the enabling environment for improved telecommunications/ICT service provision, restructuring the market, and implementing a sustainable solution for international/regional connectivity.

II. Community Consultations

a. The initial community consultation was conducted on 12 September, 2018 at the TuFHA Conference Room. Stakeholders from various Government departments, WB Liaison for Tuvalu, Churches, NGOs, Women groups, Village Council Leaders, pigsty owners on identified land, and members of the Vaiaku community were invited. Approximately 20 stakeholders were in attendance.

b. Opetaia Simati, Project Manager TvICT, provided an overview of TvAIP activities. Apologies were given from the Minister and the Acting CEO of MCT.

III. Conclusion

a. The Community Consultation will be used to complete the updated ESMP and will be reviewed with the Bank and the TvICT team.

PUBLIC CONSULTATION PROGRAMME

TuFHA Conference Room

Wednesday, 12 September 2018

Funafuti, Tuvalu

AGENDA

OPENING	
0900	Opening Prayer
0905	Introduction of panel and TvICT project.
0915	Introduction of ESMP.
0945	Proposed project site.
1030	Tea Break
1045	Environmental Risks and Mitigation Efforts
1115	Social Risks and Mitigation Efforts
1130	Grievance Redress Mechanism
1145	Questions, Comments and/or Concerns
1215	LUNCH
1230	End

Fibre Optic Cable Project (TvICT)

Environmental and Social Management Program (ESMP)

Public Consultation Minutes

Wednesday, 12 September, 2018

0900 am – 1230 pm

Presenter: MR Opetaia Simati

1. Opening Remarks

2. Opening Prayer by REV Tofiga Falani (EKT)

3. Morning Tea

4. Introduction by MR Simati and confirming of agenda. Apologies on behalf of the Acting CEO for the Ministry of Communication and Transport, MR Falasese Tupau, as other urgent matters has caused his unfortunate absence.

   This initial ESMP was prepared as a requirement for the projects Project Appraisal Document (PAD). As a requirement for the PAD, this consultation was carried out to inform the public of the project and to ensure their views are noted in the updated ESMP.

5. MR Simati's presentation was on the Fibre Optic Cable Project (TvICT) by providing background information and the objectives of TvICT. Activities under the project such as construction works and reforms to the telecommunications sector were also laid out. A landing site that was considered most suitable to the project was identified and environmental and social risks and mitigations were informed.

6. Stakeholders were given the opportunity for an Open Dialogue and Q&A Session:
   a. FUNAFUTI KAUPULE: Since your project will use imported aggregate for the construction works, are you aware that the Funafuti Kaupule also imports it and can supply it to the project?
      i. MR. SIMATI:
         Thank you, it will be noted from the project's side.

   b. WB/ADB DEVELOPMENT COORDINATION OFFICER: Should note that managing any contract under the project is fully the responsibility of the government and to ensure that contractors does not exploit or outsides the WB and Tuvalu guidelines and laws, this includes the ESMP which is now in consultation.

i. MR SIMATI: Thank you, we'll note it from this side.

c. TUVALU TELECOMMUNICATION CORPORATION:

Currently, we're using 100 MB through a satellite that has a limit of 1GB. We've been trying to develop this sector but it has been difficult due to lack of funding. Recently it has improved as the Government pays for their internet service through us. For the cable to come in and have an increased capacity of say 30GB, that's 300% more than what we currently have. And for it to cost say $200 or $100 for a MB is still a lot of money to maintain from a business perspective. If we had kept in mind options of using this fund (i.e. WB Grant) for investing in satellites, it may have been much more efficient.

Regarding where the cable is connecting. Has it been decided where we would link up to? From our view, it seems best to link to Fiji as there are more cables in Fiji to decrease risk of disruption.

We agree in regards to using the old TTC hub for the landing site as it's on the ocean side. Its installation on the lagoon side would have affected the livelihoods of fishermen if fishing is prohibited in those areas. However, the most suitable site for the distribution on the island would be, Site No.1 or 2 (i.e. far end of Runway). This is to avoid further dredges beside the runway and to use the existing ones.

Also, for this consultation, it would have seemed best to have included more stakeholders.

Comments in respond to Telecom:

i. WB/ADB DEVELOPMENT COORDINATION OFFICER: The World Bank initially came in with funding for satellite but the Government insisted on funding for the fibre optic cable.

ii. MR. SIMATI: The Pacific as well as the rest of the world has moved on to cable. The satellite currently used by TTC works, but there are still issues with it that need to be improved. There are other sectors that also need this improvement such as Education, Health and Banking so it would be highly beneficial to use this funding for a cable as per political will. Thank you Letasi for the input and yes, the government is insistent on the installation of the cable and is currently considering bids.

d. Department of Civil Aviation: I am happy for the funding provided by World Bank for this project. I'm assuming the operation will be given to TTC, but if it's someone from outside there needs to be proper contracts made prior to it. In regards to the landing site, have there been studies made on what effects the cable has to the site?

e. TVAIP: Just to add on to the responses provided by Opetaia. The ESMP is a requirement under World Bank guidelines and part of the PAD. At the moment, the funding has been agreed in principle, but has not been officially endorsed/granted. Consultations such as these are needed to be conducted so that project impacts can be conveyed, such as those with the environment. Comments from this consultation will be noted. As Telaulini said, this is the initial consultation for the project but other consultations will also take place for other phases of the project. All contractors will require to provide plans that will list out implications such as environmental and social ones and ways to mitigate these issues.

f. MR.OPETAIA: There is a process in regards to us receiving the funds in which this consultation is a part of. The running of the cable is similar to the satellite, in which a cable operator will operate it.

g. Tuvalu Telecommunications Corporation: We prefer the first landing site at the end of the runway. Not sure if you are aware, there are other developments in the process for that site and the site near the end of the runway is favourable for our data.

   The price for a MB is $3000 and has increased over the years. All other countries in the Pacific and the world, even though they run through fibre cable, they still have satellite capacity. There are many reasons why they would keep satellite capacity and mostly is for emergencies, because if a cable is damaged, it takes a while to be repaired.

   The cable will only provide internet for Funafuti and will be on maybe 2019. It will be costly as well considering our customer pool.

   i. MR.SIMATI: Thank you for your input which will all be noted. There are actually provisions in the PAD for inclusion of outer islands connectivity improvements be it via satellite for the time being, but with cable options for the future.

h. MARINE AND PORTS: Thank you for the presentation this morning. What exactly are the outputs of this project?

   i. MR. SIMATI: One of the main objectives is to improve internet services in Tuvalu. The Government has agreed to the cable, even when options for satellite were given. This is also part of Tuvalu's Kakeega III (TKIII). Briefly, I can state there are the new national ICT Policy and Legislation, the reform of the Telecom Sector, and of course the submarine cable that will bring the most impact to the required improved services.

I. TUVALU TELECOMMUNICATIONS CORPORATION: Please let it be noted that the TKIII's objective is to have free internet.

J. FUNAFUTI KAUPULE: Has the funding been approved? Also, is there a feasibility study for the fibre cable and is the cable sustainable? Especially considering that the Government wants to invest in the cable. What if it becomes damaged? Is there a plan to repair?
    i. MR SIMATI: Yes, but it's currently going through the World Bank process for development projects and mitigation efforts have been planned in case of those risks.

K. TUVALU TELECOMMUNICATION CORPORTATION: If you can, on the next presentation to include how much we have to pay for maintenance on say a monthly basis. This presentation is focused mainly on paybacks of the cable but it has to include the hidden costs as well.

L. EKALESIA TUVALU (EKT): When will the cable be running?
    i. MR SIMATI: At the moment it's estimated for 2020 or thereabouts and we will continue to use satellite until then.

Tuvalu Fibre Optic Cable Project (TvICT) Public Consultation

Wednesday, 12th September, 2018

TuFHA Conference Room

No.	Name	Title	Organization	Signature
1	Pualagi F	HEO	HRM	
2	Awisi P	COO	TTC	
3	Simeti	GM	TTC	
4	Tofiga	Faifeau	EKT VAIAKU	
5	Tele	ICT Officer	ICT	
6	Sioata	LGO officer	DRD	
7	Telculini	Civil Aviation	Aviation	
8	Thum	DMPS	MEPS	
9	Veana	IT KAUPULE F/FUTI	KAUPULE F/FUTI	
10	Vitoli.F Josefa	PM-TVAIP	TVAIP	
11	Lefasi Iulai	DCO	WB	
12	Iunipa	SISP	ICT	
13	Dolores Lenewoh	CLMO LANDS	LANDS	
14	Polevia.T	Network officer.	ICT	
15	Tauala.P	Secretary	Kaupule	
16	Opet S	Director	ICT	
17	Aveta	FICC	Judiciary.	
18	Tanula.P	Safeguards Admin Off.	TvAIP	

telecom TUVALU

DATE: Friday 10th November, 2023
VENUE: TTC Conference Room

FTTP Consultation - Participant List

No	Name	Department/Role	Email	Sign
1	Tutonu. Seni Bruce	A: SEC Kaupule Funafuti.	t.bruce@kaupule.funafuti.tv e.kausea@kaupule.funafuti.tv	
2	Bennett Simeon	TTC / CTO	bsim@tuvalutelecom	
3	TOMALU · TALY	TTC / CTE	talu@tuvalutelecom.tv	
4	TOFIGA · FINILAU	OLG	ffinilau@gov.tv	
5	Reuben. Kausea	D.O.E	rkausea@gov.tv	
6	Alapati Taupo	TTC / CFO	alapati@tuvalutelecom.tv	
7	Emily Lafai	D.W.M	EEliu@gov.tv EFalega@gov.tv	
8	Masina. Loiaua	TGC	mafalulo@tuvalugov.tv	
9	Taukei Lesoa	PWD	[illegible]@gmail	
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13				
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