

Federated States of Micronesia

Enhancing Climate Change Resilience of Vulnerable Island Communities in FSM

Environmental and Social Management Plan

ENHANCING THE CLIMATE CHANGE RESILIENCE OF VULNERABLE ISLAND COMMUNITIES IN FSM

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Quality Information

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Revision History

Revision	Revision Date	Details
A	May 2016	ESMP for Project Preparation
B	October 2019	Updated for Project Implementation

Glossary

AF	Adaptation Fun
AP	Affected Persons
CBA	Cost Benefit Analysis
DECEM	Department of Environment, Climate Change and Emergency Management
DTI	Department of Transport & Infrastructure
EE	Executing Entity
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
ESCP	Erosion and Sediment Control Plan
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Safeguards
FSM	Federated States of Micronesia
GRM	Grievance Redress Mechanism
IE	Implementing Entity
IWRM	Integrated Water Resource Management
KIRMA	Kosrae Island Resource Management Authority
KSMP	Kosrae Shoreline Management Plan
NGO	Non-Governmental Organisation
NWSP	National Waste and Sanitation Policy
PCT	Project Coordination Team
SCT	Self-Composting Toilets
SECP	Stakeholder Engagement and Consultation Plan
SPREP	Secretariat of Pacific Regional Environmental Program
TOR	Terms of Reference
WASH	Water, Sanitation and Hygiene
WHSS	Water Harvesting Storage System

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1 Introduction

The Adaptation Fund's 'Enhancing the Climate Change Resilience of Vulnerable Island Communities in the Federated States of Micronesia' project (the project) has been designed to provide climate resilient interventions focusing on water security and coastal management. The overall goal of the project is to build social, ecological and economic resilience of the target island communities of FSM and reduce their vulnerabilities to extreme drought, sea level rise and other climate risks through water resource management and development planning, and by promoting gender perspectives and ecologically sound climate resilient livelihoods.

The project will achieve this through four components:

Component 1: Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands.

Component 2: Demonstration of water security and sanitation measures in outer islands of Yap, Chuuk and Pohnpei.

Component 3: Demonstration of adaptation measures for coastal communities in Kosrae State.

Component 4: Knowledge Management for improved water and coastal protection.

This Environmental and Social Management Plan (ESMP) has been prepared to document the environmental and social risks and impacts presented by the project and sets out the associated mitigation and management measures that will be implemented as part of project delivery.

The process leading to the development of this ESMP reflects and is based on the initial assessment by SPREP that the project is a 'Category B' project with moderate and manageable impacts confirmed to a limited geographic area. The most significant risk arises around Component 3 of the project (the Kosrae adaptation measures), and for which a targeted Environmental Impact Statement (EIS) for the road design (and future construction) has been undertaken and specific management strategies and actions devised.

Initial project screening based on the EIS, field investigations, stakeholder meetings and desktop 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, **as long as the allocated budget for Component 3 is sufficient to meet the full design technical specifications for the entire length of the Malem to Utwe road (new and existing sections plus access roads)** 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. This statement will be reviewed against the final detailed design when it is completed. In accordance with The Adaptation Funds (AF) Environmental and Social Safeguard (ESS) policy, an environmental assessment is required to adequately screen and assess potential environmental and social impacts, and to prepare an ESMP.

Additionally, in accordance with AF ESS safeguard policy regarding involuntary resettlement, a screening of the land required, 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 FSM's relevant laws and regulations and the Environmental and Social Safeguards Policies of the Adaptation Fund.

The ESMP provides the set of mitigations, monitoring, and institutional measures to be taken during the implementation and operation of the 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.

At this stage of project preparation, there are still some unknowns such as the specific locations of water security interventions under Component 2 therefore this ESMP provides guidance for screening of potential locations to assist with the final selection process, and covers all foreseeable risks and impacts and provides the relevant suite of mitigation measures.

1.1 Integration of ESMP

It is the responsibility of SPREP as the Implementing Entity (IE) and the Executing Entity (EE) under the Department of Environment, Climate Change and Emergency Management (DECCEM), to ensure that the ESMP is fully integrated into the Project. It is the IE's responsibility that proper processes and monitoring is in place to ensure the project is delivered with no significant negative environmental or social impact.

SPREP and DECCEM (as the respective IE and EE) will:

- Ensure that all government employees and contractors are sensitized on aspects of the plan and received appropriate training to fulfil their individual environmental and social responsibilities.
- Ensure that the necessary resources and skills are retained to successfully carry out all mitigation measures.
- Formally monitoring and report on the environmental and social performances of all activities.
- Require that contract services manage their environmental and social performance in line with this ESMP.

DECCEM will also coordinate the State Project Coordination Teams (PCT) to:

- Continually monitor and report as needed issues related to social and environmental risk.
- Raise awareness amongst target communities on the Environmental and Social Policy of the AF and this ESMP

The ESMP shall form part of any bid documentation or TOR, and it shall be the IE's responsibility to ensure that ALL procurement documents and contractual specifications is subject to review against this ESMP to ensure that all appropriate safeguard measures are captured at the bid stage and in all contracts.

It is further the responsibility of the IE's to ensure that this ESMP is considered in review of any Terms of Reference (TOR) for Technical Assistance developed for the Project. The safeguard requirements for any design or supervision of the Project will be fully integrated into 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.

1.2 Disclosure

As part of the requirements of FSM national and state laws and AF ESS policy, the ESMP is to be publicly disclosed by the DECEM as the EE responsible for project implementation. DECEM will ensure the ESMP is disclosed 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, DECEM will ensure that several copies of all prepared safeguard instruments are available locally at the relevant State Government offices and easily accessible to affected groups and local Non-Governmental Organisations (NGOs).

The ESMP will be reviewed, updated and approved if necessary. For each approved updated version of this ESMP, the DECEM as the EE will be responsible for disclosure through the above channels.

2 Project Description

This section is informed by the FSM Adaptation Fund Project Proposal Document, the Kosrae Road Relocation Environmental Impact Statement and other supporting documents with additional information obtained through consultations with the IE and EE project teams and a site visit to Kosrae. The information in this section has been used to inform the ESS assessment and management plan

2.1 Project Overview

The project seeks to enhance the community resilience through working with communities focusing on improving water security measures in outer islands of Yap, Chuuk and Pohnpei, and increasing the resilience of coastal communities to adapt to coastal hazards and risks induced by climate change. The project is expected to deliver a set of targeted and interlinked economic, social and environmental benefits, as well as serve as a model for future replication throughout the four states of the country in other sectors (food security, marine resource management). The project will promote a set of innovations, together with partner institutions/organisations that will help create better living conditions for the outer islands and coastal communities of FSM.

The overall goal of the project is to build social, ecological and economic resilience of the target island communities of FSM and reduce their vulnerabilities to extreme drought, sea level rise and other climate risks through water resource management, coastal resources and developments planning, and by promoting gender perspectives and ecologically sound climate resilient livelihoods.

The overall objective of the project is to reduce the vulnerability of the selected communities to risks of water shortage and increase adaptive capacity of communities living the identified villages to drought and flood related climate and disaster risks.

The overall objective is broken down into the following project objectives:

Project Objective 1: Prepare the necessary institutional and regulatory frameworks, policies, guidance and tools to help deliver a climate resilient FSM.

Project Objective 2: Strengthen water and livelihood security measures to help 6 outer atoll islands adapt to impacts of climate change related to water, health and sanitation.

Project Objective 3: Provide communities with climate resilient infrastructure to help relocate from high risk coastal inundation sites.

Project Objective 4: Capture and share the local knowledge produced on climate change adaptation and accelerate the understanding about the kinds of interventions that work in island environments in FSM.

These objectives will be achieved through the project strategy to provide all four State Governments in FSM with development planning tools and institutional frameworks to help coastal communities prepare and adapt for higher sea levels and adverse and frequent changes in extreme weather and climate events. The project strategy is also to provide communities with the resources and technical support needed to adopt and manage concrete climate change initiatives and actions.

The project sets out to achieve this through the following project activities, grouped by component and expected outcomes.

Table 1: All proposed project components, outcomes, outputs and activities.

Project Components	Expected Outcomes	Expected Outputs	Project Activities
1. Strengthening policy and institutional capacity for integrated coastal and water management at national, state levels and outer islands.	Strengthened policy and institutional capacity of government to integrate climate risk and resilience into its water and coastal management legislative, regulatory and policy frameworks	1.1 Legislation and policy paper to guide regulation of climate resilient coastal and marine management at national level.	1.1.1 Review of National-level legislation and policies for: (i) infrastructure to identify climate change requirements and (ii) regulatory and policy framework for climate change .
			1.1.2 Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant Departments.
		1.2 State regulations for coastal and marine development projects amended to consider climate change risks and resilience measures.	1.2.1 Review of State-level legislation and policies for infrastructure to identify climate change requirements.
			1.2.2 Develop guidance based on recommendations from the review of coastal and marine management legislation and policy) and monitor progress of recommendation uptake through relevant Departments.
		1.3 State Water Outlook and Water Sector Investment Plan developed and implemented.	1.3.1 Support the implementation of State-level Water Outlook and Investment Plans.
		2. Demonstration of water security measures in outer islands of Yap, Chuuk and Pohnpei	Water conservation and management technology & practices adopted, responding to drought, sea level rise and early recovery from cyclones.
2.1.2 Carry out ground-truthing assessments.			
2.2 Water Harvesting and Storage System (WHSS) repaired and installed in 6 atoll islands.	2.2.1 Repairing household rainwater harvesting and storage system.		
	2.2.2 Constructing community rainwater harvesting and storage systems.		

Project Components	Expected Outcomes	Expected Outputs	Project Activities
			2.2.3 Implementation of a monitoring and maintenance programme.
	Appropriate sanitation measures for the outer islands of Yap, Chuuk and Pohnpei are determined for future investment.	2.3 Assessment of viable sanitation measures for outer islands in Yap, Chuuk and Pohnpei.	2.3.1 Sanitation measures assessed and piloted in outer islands in Yap, Chuuk and Pohnpei.
3. Demonstration of adaptation measures for coastal communities in Kosrae State	Increased resilience of coastal communities and environment to adapt to coastal hazards and risks induced by climate change.	3.1 3. Malem - Utwe inland road and access routes designed for future construction.	3.1.1 Survey and design road and related infrastructure to ensure climate change resilience.
		3.2 Transitional coastal protection at Mosral and Paal upgraded for immediate coastal protection.	3.2.1 Upgrade coastal protection works.
4. Knowledge management for improved water and coastal protection	Capacity and knowledge enhanced and developed to improve management of water and coastal sectors to adapt to climate change.	4.1 Resource materials developed, tailored to local context, translated, published, and shared amongst various stakeholders.	4.1.1 Undertake knowledge management, communication and engagement activities.
			4.1.2 Capture and document data and information generated by the project.

2.2 Project Sites

The project activities in Table 1 will be implemented across FSM. Figure 1 and Figure 2 below gives geographical context to the States of FSM which are discussed throughout the ESMP.

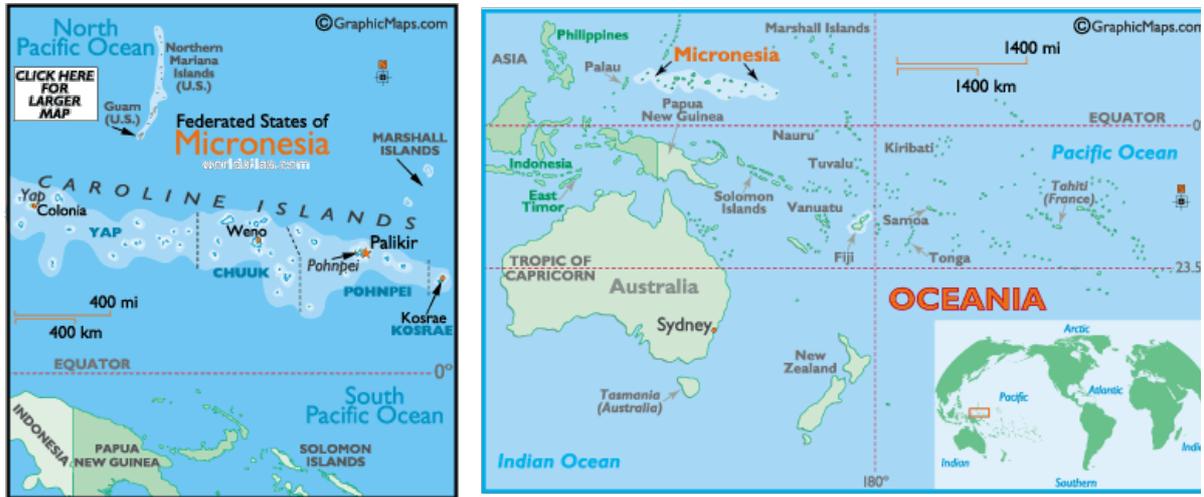


Figure 1: Federated State of Micronesia geographic context

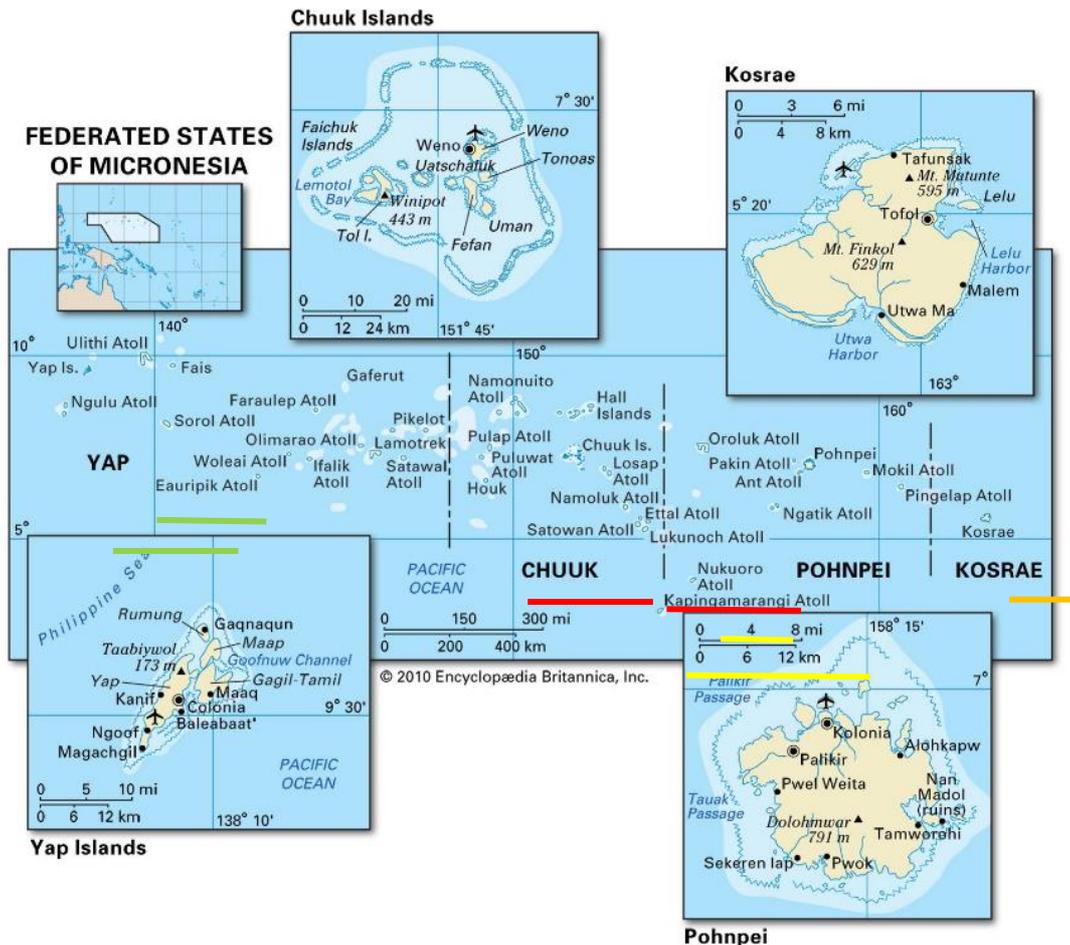


Figure 2: States of FSM

The Government of FSM has identified two outer islands each in Pohnpei, Chuuk and Yap states as priorities for the water security component of this project. These are Kapingamarangi and Nukuoro in Pohnpei; Satawan and Lukunor in Chuuk and Eauripik and Woleai in Yap. The majority are among the atolls most remote from their respective mainland. Figure 1 highlights the atoll location of these islands while the subsections below show the location of the islands nominated under component 2.

2.2.1 Pohnpei: Kapingamarangi and Nukuoro

Kapingamarangi and Nukuoro are the two Pohnpei atolls that will be addressed by the project, with a population of 350 and 210 respectively. Both atoll's ground water resources are already susceptible to sea water intrusion, underground water pollution and surface water pollution from agricultural practices.

Kapingamarangi atoll (Figure 3) is by far the most southerly atoll or island of the country. The total area of the atoll, including the lagoon, is 74km². Out of this, 1.1km² is land area, spread over 33 wooded islets on the eastern side of the atoll, three of which are inhabited. The western reef rim of Kapingamarangi atoll is almost submerged at high water. Much of the islets on this western reef that is used for growing fruit and vegetables are now under threat. As a result, the islanders are now looking to move the growing of such fruit and vegetables to the same islets where they are raising livestock as well as on the main island of Touhou where people reside. This is already putting pressure on the water resources on Touhou, where the highest point is only 90 cm.

Nukuoro is another outlying atoll (Figure 4) in southern FSM. The total area, including the lagoon, is 40km², with a land area of 1.7km² which is divided among more than 40 islets that lie on the northern, eastern and southern sides of the lagoon. By far the largest islet is Nukuoro islet, which is the center of population and the capital of the municipality. On Nukuoro, the staple food crop is taro. Taro is highly susceptible to sea water intrusion. During drought, the communities use raised swamp taro patches as water reservoirs to catch water for cooking and washing. Buckets and recycled oil-drums are a common method of storing water at the household levels. The population of Nukuoro are highly vulnerable to water and vector-borne diseases as a result of poor quality of water.



Figure 3: Kapingamarangi atoll with largest settlement shown (yellow star)



Figure 4: Nukuoro atoll with largest settlement shown (yellow star)

2.2.2 Chuuk State: Satawan and Lukunor

Satawan (Figure 5) with a population of 692 and Lukunor (Figure 6) with a population of 848 are the two Chuuk atoll communities that will be addressed by the project.

Satawan atoll is located about 250km southeast of Chuuk lagoon proper. It has a land area of about 5km². There is a primary and secondary school that serve the islands but no regular electricity of running water. Lukunor is a small atoll located about 264km to the southeast of Chuuk.

On both atolls, the islands are only three to five meters above sea level and are therefore prone to impacts of sea level rise. The islands water wells are brackish and provide only limited water. Some wells are only used to draw water for washing and cooking during drought, as it is unsafe for general

consumption. Most water wells are not covered, and therefore contamination from sea water, e-coli, and humus is common. Most of the households on both islands have at least one water tank, which has found to be unsustainable during drought. The rainwater harvesting systems are in poor condition as a result of sustaining damage from typhoons, lack of spare parts and poor maintenance, leaving these communities highly vulnerable to drought. During periods of drought, people and animals often resort to coconuts and root trees for water and hydration.

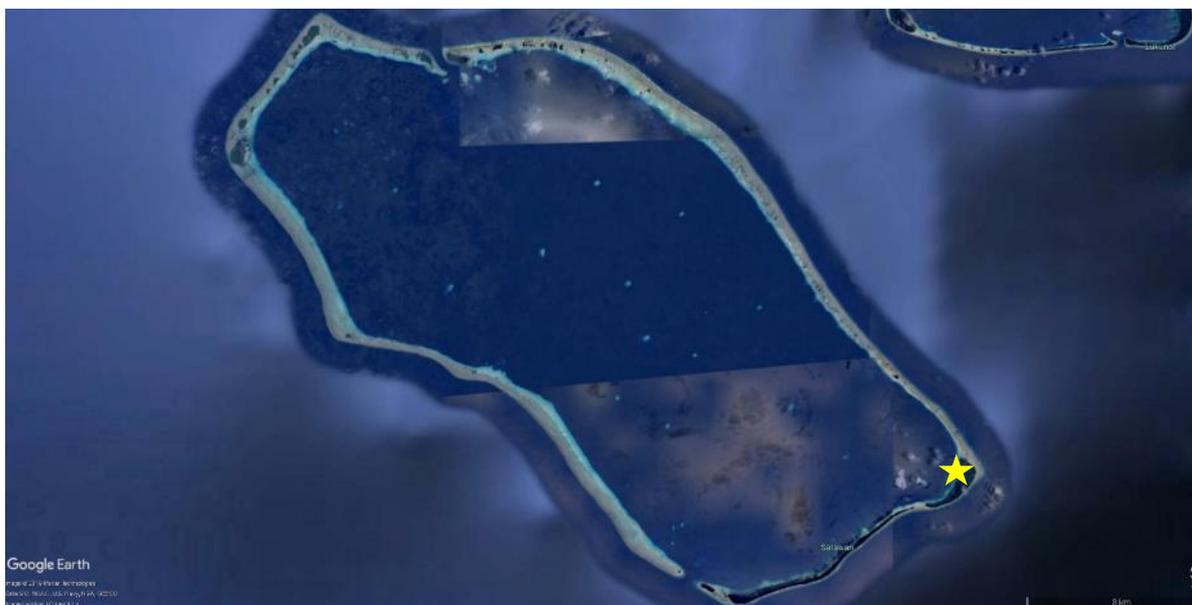


Figure 5: Satawan atoll with largest settlement shown (yellow star)



Figure 6: Lukunor atoll with largest settlement shown (yellow star)

2.2.3 Yap: Eauripik and Woleai

Eauripik (Figure 7) and Woleai (Figure 8) atoll's are two of 14 outlying atoll's administered by Yap state. Eauripik atoll has a population of 113 and consists of three islands with a total land area of 0.24km². All the islets are covered with coconut palms. Eauripik is one of the smallest and most

remote populated islands in the Pacific. Its population live at a high density and combine subsistence production of tree and root crops with various forms of fishing from reefs, lagoon and ocean.

Woleai atoll is approximately 108km northeast of Eauripik. It is a coral atoll of twenty-two islands, the largest of which is called Woleai. The northern and eastern rims of the atoll have several relatively large islets and the atoll itself has a total land area of 4.5km².

The significance of climate change to the State of Yap is set out in the Joint State Action Plan. As the westernmost state of FSM, Yap is exposed to a range of threats that create significant vulnerabilities for the state. Yap is in 'Typhoon Alley', is likely to be disturbed by earthquakes and tsunamis, and suffers droughts due to the impact of El Niño Southern Oscillation (ENSO). ENSO is also the cause of both excessive and below average rainfall. Yap is drier than the other states of FSM and is highly susceptible to drought. The lack of adequate water storage capacity on the outlying islands increases the inhabitant's vulnerability to the impacts of drought. Yap is very vulnerable to flooding during typhoons and storm surges. The state does not regularly receive large amounts of rain and thus the damage from extreme surge and rainfall events is usually much more intense.

The distances between islands makes it difficult to get much-needed food, water and medical supplies to residents after a disaster, meaning Yap is more vulnerable to health and other secondary impacts of disasters than the other FSM states. Through July 2015 and January 2016 island leader and community consultations, facilitated by the government of Yap through the Department of Resources & Development and SPREP, the atoll islands of Eauripik and Woleai are nominated for water security measures. The most recent impacts caused by Typhoon Maysak and the recent 2015-2016 El Nino phenomena was felt strongly at these islands requiring water resources to be secured.



Figure 7: Eauripik atoll with largest settlement shown (yellow star)

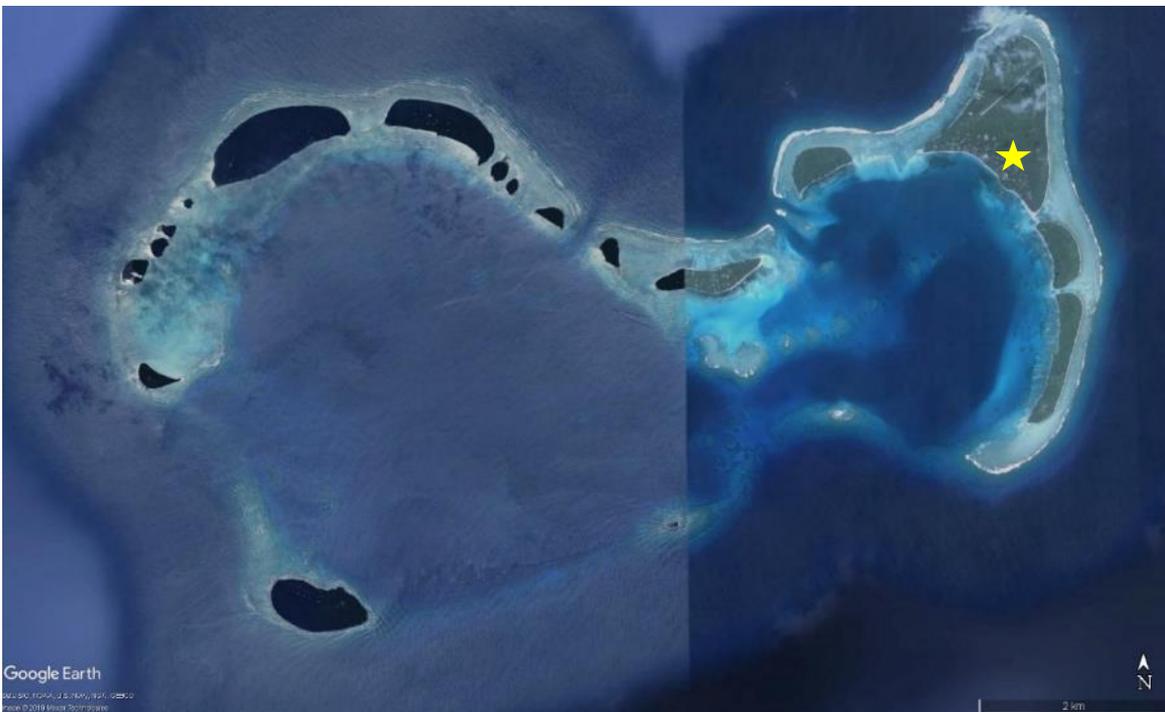


Figure 8: Woleai atoll with largest settlement shown (yellow star)

The government has also focused on building the capacity of the communities of Malem and Utwe in Kosrae to respond to climate as well as improving the resilience of its infrastructure and natural environment to climate change under component 3.

2.2.4 Kosrae State

Kosrae (Figure 9) is the easternmost and second largest island of the FSM, located approximately 372 miles southeast of Pohnpei. Kosrae has a land area of 112km² and a population of just over 6,000 people.

Kosrae is the only state without an outer island. It is divided into four municipalities, with respective populations as follows: Lelu (2,160), Malem (1,300), Tafunsak (2,173) and Utwe (983).

Geographically, the state is characterized by steep mountains and deep valleys covered with thick, fertile tropical vegetation and forests, and dense mangrove forests in coastal areas. The island's main natural resources are its abundant forests with significant agricultural potential, marine products and deep-seabed minerals¹.

Kosrae is a high volcanic island surrounded by a fringing reef, mangroves and coastal strand forests that have been historically used for lumber and fuel by residents. There is a shallow fringing reef spotted with boulders of coral heads that have been dislodged from the fore – reef during occasional cyclone events. There are no outer islands. The island has steep, heavily vegetated watersheds, which in the mid to upper parts of the catchment are in relatively natural state. Where clearing or deforestation on sloping areas does occur, however, intense rainfall quickly denudes exposed soil. Invasive vegetation is a significant problem and has taken a foothold in many of the lower parts of many of the catchments.



Figure 9: Kosrae State with Malem (yellow) and Utwe (blue) shown

2.3 Physical Interventions

This subsection looks in more details at the physical interventions planned under components 2 and 3 drawing from the Project Proposal Document and Kosrae site visits. The Project Proposal Document (Part II, Section A) goes into more detail on the following sections and should be referred to in conjunction with this ESMP.

2.3.1 Water Security Interventions (Component 2)

2.3.1.1 Water Harvesting and Storage Systems (WHSS)

Ground truthing assessments (project activity 2.1.2) will be carried out to reaffirm data and recommendations gathered from the consultations carried out during the planning stages of the project (July, November 2015; January, February 2016), and from rapid assessments carried out by

¹ Federated States of Micronesia Infrastructure Development Plan FY2016-FY2025. Volume 6 Yap State Infrastructure Development Plan

the Department of Resources and Development, and International Organisation for Migration (IOM) in March 2016. This will include carrying out technical surveys on water, water use in the community villages on the islands, sanitation and health incidences related to water. These surveys will also collect information on social aspects such as traditional knowledge, cultural and political governance and how these may influence the implementation and management of the project.

Following on from this, the water harvesting and storage systems will address the climate stresses, namely the prolonged periods of drought such as those experienced in the 1997-1999, 2003-2005, 2015-2016 El Nino events, and the extreme weather events leading to high intensity rainfall, and lengthening of the dry season months.

At present, various types of water harvesting systems exist in poor conditions on the islands and people resort to coconut juices to meet their water harvesting demands². The rainwater harvesting and ground water wells that exist are largely privately owned. The current rainwater harvesting systems and storage elements including roofing, guttering, down piping, water tanks and concrete tanks. All systems are in poor, basic or unusable conditions as a result of damage from cyclones, extreme high tide events damaging infrastructure coupled with no maintenance due to lack of equipment and spare parts³. In Yap, for example, 40% of water tanks on all nine outer islands including Woleai and Eauripik do not have proper rain harvesting systems (tin roofs for collecting rainwater and gutters including down spout, fasteners and clips). Nearly 90% of water wells had very low water levels; all are brackish and nearly all were uncovered. These neglected or nonfunctional wells often become a breeding ground for mosquitos bringing a risk to public health by increasing vulnerability to communicable diseases.

The project (activity 2.2.1) will rehabilitate, and repair existing materials of the household and community systems selected from the ground truthing assessments to close leaks and improve efficiency of existing rainwater harvesting systems. It will extend the gutters to the full dimensions of the catchment to capture more water; increase the catchment area to improve long-term water security and storage tank size overflow is frequent.

In addition to the repair activities, the project will construct (activity 2.2.2) community tanks to assist the larger community in times of drought to relieve pressure on individual household water tanks and to meet basic water requirements for the medium-term survival needs. These include meeting not only the short-term survival requirements of drinking and cooking, but personal washing, washing clothes, cleaning home, growing food and sanitation and waste disposal. The construction of community tanks will be undertaken under the following minimum requirements:

² Rapid Assessment Report, March 2016 FSM

³ FSM Adpation Fund Project Proposal Document

COMMUNITY LEVEL	
Rainwater catchment systems	
Key activities	Install community tanks
Minimum requirements	<ul style="list-style-type: none"> • _ Minimum 2 x 5,000 L / 2,000 Gallon HDPE tanks per atoll island > 100 population • _ <100 population requires re-assessment • _ > 400 population = 4 tanks • _ HDPE tanks preferred over concrete tanks • _ Extend gutters to full dimension • _ Catchment area sized appropriately to tank volume using reliability curves. • _ Encourage standalone catchment areas to shelter tanks and fence for protection • _ Access and maintenance rules established and to include cleaning each tank on a rotation basis, cleaning to be 3 times per year • _ Rules for access to include access by neighboring villages in times of drought • _ Maintenance schedules established
	Design and Upgrading of Wells
Minimum requirements	<ul style="list-style-type: none"> • _ Municipal council review, assessment and executive orders on environmental advice on burials to encourage use of existing cemeteries and reconsider burials in private residences and plots • _ Exceptions to consider sites down hydrological gradient from wells.

The table above is sourced from the original project documentation. This ESMP provides additional safeguard measures (Section 7.2.1) for the location, land management around and use of wells. DECEM PMU will ensure these additional requirements are incorporated into the bid documentation for design and/or construction of these interventions.

2.3.1.2 Self-Composting Toilets (SCT)

SCTs are proposed for each of the six islands identified under the water security component, however the exact numbers and locations of SCTs have not been finalised. It is known that wherever they are installed, there will be at least one unit each per gender.

During project preparation, the community leaders of the outer islands chose to invest in technologies to conserve water as much as possible to respond to the drought periods driven by El

Nino. Self-composting toilet technologies has been chosen as one of the investments along with RWHSS. The technologies have been proven in communities in Tuvalu and Nauru through the Integrated Water Resource Management (IWRM) project in partnership with PACC, as one of the best solutions to conserve water as it uses no water at all, and the technology avoids sewage contamination of the groundwater. It therefore promotes replenishment of groundwater useful for bathing, washing, planting, and depending on the environment for cooking. The current practice of using the lagoon side as toilets will be reduced significantly as the schools and community halls or public places – will be targeted by the project to install these units. This practice contributes to reducing marine eutrophication on the lagoon side.

This project will therefore aim to develop a plan to promote self-awareness on the benefits of self composting toilets to adapt to and respond to climate change in the immediate to long-term. It will demonstrate the units at schools and/or community halls, churches, etc. It will train teachers, boys, girls and community members on the use of the units and its functions. It will train the beneficiaries on WASH and water conservation practices in school and communities as well as monitoring and care after.

The cultural diversity amongst the six outer islands of the three states suggests there may be diverse preferences for the types of sanitation technologies used on the islands. The absence of pit toilets on some of the islands on the atoll in Woleai and Eauripik in Yap and Satawan in Chuuk are a blessing for the local groundwater and its quality. In these locations, the benefits of the SCT should be clearly communicated to ensure that pit latrines continue to be avoided. A concern would be that continued avoidance of the pit latrine would lead to communities using open defecation on land or beaches or defecation in the ocean. There is possible evidence of eutrophication during low tide on the lagoon side. The onset of climate stresses that include increase in sea surface temperatures will exacerbate this problem contributing to food security issues as well as water, sanitation and health issues.

The project proposal document notes that the ground-truthing assessments in activity 2.1.2 may yield some results on disagreement to proceeding with output 2.3 and its activities. The result may come from any of the six island communities as a result of cultural and social barriers. In the event that this output is not entertained, the project team will refer the community / island to other community potential alternative adaptation priorities they identified during project planning consultations.

2.3.2 Kosrae Infrastructure Investments (Component 3)

2.3.2.1 *Paal and Mosral Coastal Defence Upgrade*

The Kosrae Shoreline Management Plan (KSMP) identifies that over the short-term the effect of sea-level rise on the ability of coastal defences to provide a “satisfactory” level of protection is likely to be manageable through, for example upgrading the level of protection of these existing defences. Upgrading of the critically threatened sections of road at Paal and Mosral (Figure 10) is a suitable transitional defence while the long-term solution of relocating the road inland is implemented. This is undertaken only with a view to provide short to medium term protection.

Emergency works (Figure 11) were subsequently conducted in response to high tides and waves undermining the road at Paal and Mosral in early 2014. This was an emergency measure involving dumped and roughly placed recycled concrete slabs from the upgrading of the runway hard standing, and at Mosral of large concrete filled bags to create a wall. Whilst the emergency works

has stabilized the immediate undermining of the road, the ad hoc nature of the construction, does not provide an adequate level of protection to the road with over wash being experienced during storm or high wave conditions.



Figure 10: Paal (blue circle) and Mosral (yellow circle) sites for coastal defences upgrade works



Figure 11: Existing emergency coastal defence works at Mosral (left) and Paal (right)

At Paal, the 160 m length of the emergency defences will be reconstructed (Figure 12). This will involve:

1. Remove the existing dumped concrete rubble to enable the underlying sand and coral rubble material to be regraded approximately 1:2 slope.

2. Geotextile filter layer will be laid between the underlying material and the armour layer to prevent wash out and winnowing of fine material between the armour layer.
3. The concrete slabs are of a sufficient size to withstand design wave conditions over the reef flat at Paal. These will be reused as the armour layer for the base and lower part of the face of the revetment and will be laid at a slope of 1:2 in a stepped manner.
4. There are insufficient concrete slabs to complete the full stepped revetment. Basalt rock armour, sourced from an existing permitted quarry inland between Paal and Mosral, will be used to complete the crest of the revetment. Armour rock will be a minimum of 0.66 m in diameter and will be laid at a 1:2 slope with the crest of the revetment at least 3 rocks wide. The crest of the defence will be above the elevation of the road.
5. At the southern end of the reconstructed defence the revetment the road curves inward with a wider coastal buffer protecting it, with the shoreline position at this location, "held" by a small strand of reef flat mangroves. The revetment will extend behind the existing shoreline at this point to ensure that outflanking and down drift erosion does not occur.

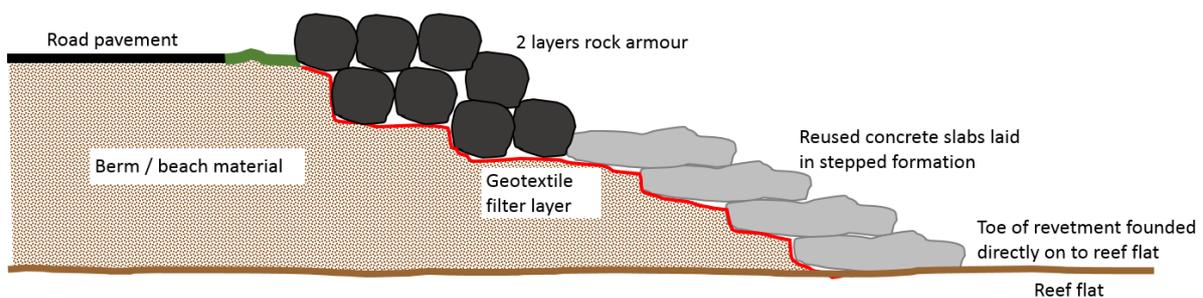


Figure 12: Cross-section of the proposed reconstructed revetment at Paal. Source: Project Proposal Document

At Mosral, the 110 m length of the emergency defences will be reconstructed (Figure 13). This will involve:

1. Remove the existing dumped large concrete blocks and rubble to enable the underlying sand and coral rubble material to be regraded to approximately a 1:2 slope.
2. The small fillet of sand beach in front of the existing defence will be stockpiled on the adjacent reef flat and re-instated in front of the reconstructed defence on completion.
3. Geotextile filter layer will be laid between the underlying graded slope and the armour layer to prevent wash out and winnowing of fine material between the armour layer.
4. The concrete blocks are of a sufficient size to withstand design wave conditions over the reef flat at Mosral. These will be reused as the armour layer for the base of the revetment and will be laid to form the base of the revetment.
5. There are insufficient concrete blocks to complete the full revetment. Basalt rock armour, sourced from an existing permitted quarry inland between Paal and Mosral, will be used to complete the crest of the revetment. Armour rock will be a minimum of 0.66 m in diameter and will be laid at a 1:2 slope with the crest of the revetment at least 3 rocks wide. The crest of the defence will be above the elevation of the road.

- At the southern end of the reconstructed defence the revetment there is potential for down drift erosion to occur and outflanking of the defence. To prevent this, the slope of the revetment will be constructed at a shallower slope and the armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to beach and prevent any exacerbated erosion on the coastline immediately to the south.

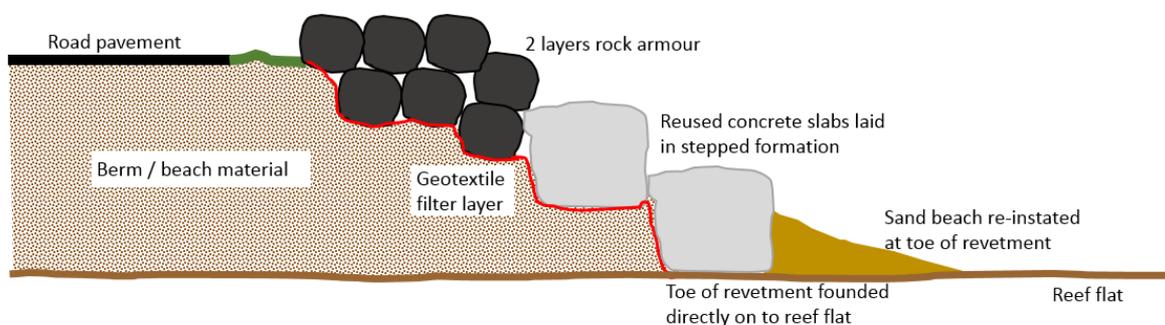


Figure 13: Cross-section of the proposed reconstructed revetment at Mosral. Source: Project Proposal Document

TC&I will supervise and provide oversight of the design and construction of the coastal protection works at Paal and Mosral. It will provide oversight of the work ensuring quality control and the activity will be in compliance with the protective engineering structure design standards of the Kosrae circumferential road extension project (ADB, 2005). The proposed works have been permitted through KIRMA's Development Review and permitting process and KIRMA will provide oversight to ensure all design and environmental requirements are adhered to during the construction.

2.3.2.2 Kosrae Inland Road (Malem to Utwe)

The KSMP developed a prioritised list of inland road and essential infrastructure development to be implemented over the next one to two generations as an essential component for developing resilience to coastal-related hazards and sustained adaptation to climate change. Developing and upgrading the inland road between Malem and Utwe was considered the highest priority due to the current threats posted to vulnerable populations and infrastructure due to wave overwashing and potential breaching of the narrow coastal berms upon which present infrastructure and much of the population of Utwe and Malem municipalities are located.

This activity will design the inland road up to an sealed (asphalted) standard. Figure 14 shows the detailed road alignment along with respective section types and lengths between Malem and Utwe (See Annex 1 for larger version). This final road alignment selection process is detailed in the Environmental Impact Statement.

This is the first stage of the inland road construction. Construction of the road in the future should be subject to a new environmental assessment and permitting.



Figure 14: Detailed road alignment for Kosrae Inland Road

To date, the full road alignment has been subject to a topographic and geological survey by the design engineers, there is also a draft detailed design which has been developed by the engineer. This has been costed at USD\$3.9m and is for the three sections of new alignment only (the red sections in the figure above). The engineer is currently upgrading their design to take into account the entire proposed inland road and additional changes to the design, and this will have implications on the cost.

The inland road design is based on the design standard developed for Kosrae circumferential road extension project (Barret Consulting Group, Inc, 1987) and is consistent in design to other parts of Kosrae’s primary road network. It assumes:

A 60ft standard road easement width (Figure 15):

- The road design and construction is to be extended from the original 3.6 miles of priority sections of upgraded road (i.e. Malem to Pilyuul (Section 3), Malem to Utwe (Section 2) and Utwe (Section 1)) to 5.53 miles which will include the road in its entirety (refer Figure 1) and an additional access road.
- The road surface is to be upgraded from the gravel sub-base to asphalt to accommodate the adaptation requirements (i.e. 50 years life span) and erosion and runoff concerns.
- The road lane width is to be reduced from 12 feet to 10 feet per lane, ensuring consistency with FSM standards for road width.
- A 3% cross-section drainage gradient for the sub-base surface (although consultations between EE and the design engineer suggested that a steeper gradient may be required in hill terrain to minimise road surface erosion);
- Existing sections of inland farm roads will be widened to obtain a roadway width of 30ft., and include construction of roadway drainage structures (bridges and culverts) and resurfacing to sub-base course level;
- The design is to include all earthworks, retaining walls and erosion considerations to meet the best standards and to reduce the environmental impacts due to the steep alignment of the road.

- The design is to incorporate areas of historical and cultural importance to ensure these are avoided.
- The rights-of-ways are to be provided to EMPSCO for incorporation into the road design.
- The mitigation actions detailed in the Environmental and Social Safeguards Plan are to be incorporated into both the design and construction phases as appropriate for each phase.
- An integrated infrastructure approach is adopted which includes relocation of power distribution, and any water or telecom service infrastructure. The design phase should include all utilities and scoping / design work on this will need to be tendered.

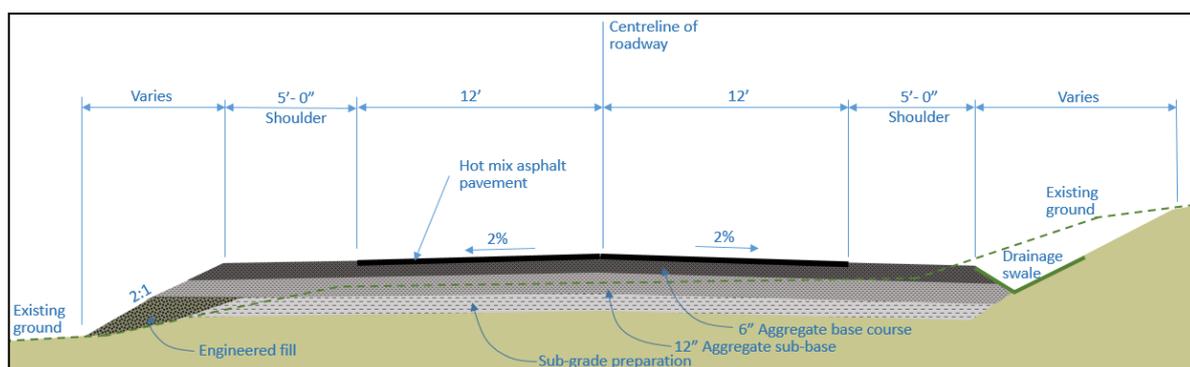


Figure 15: Typical road cross-section. Based on the design standard developed for Kosrae circumferential road extension project (Barret Consulting Group Inc., 1987). Source: Project Proposal Document.

Several activities have been or will be undertaken to design and prepare for future construction of the total distance of the Malem-Utwe inland road and access routes as follows:

- Light impact vegetation clearance (completed)
- Full topographic survey (completed by design engineers)
- Full survey by Kosrae's Historic Preservation Office (completed)
- Full geological survey (completed by design engineer)
- Detailed design for each section of road (underway by design engineer)
- Procurement of companies to provide the goods and services to support DTI in construction of the road
- Future construction of the road (including earthworks and land clearance)

The original project proposal document states that the proposed inland road between Malem and Utwe will be 3.6 miles (5.8km) in length made from a combination of access roads, existing farm road and new road construction. There has been a budget of USD\$788,000 allocated for this activity to complete the design of the road to a sealed, asphalted level.

2.3.3 Kosrae Road Analysis of Alternatives

The Cost Benefit Analysis (CBA) report for this activity looked at several alternatives from a CBA perspective. Environmentally and socially, these same key alternatives are discussed below:

Construct road to asphalt level in first instance: There are several potentially significant impacts identified in this ESMP which are linked to erosion and sedimentation. The primary factors which will control the scale of this impact are (i) project budget and (ii) time lag between project completion and upgrading road to asphalt surface. As there are unknowns over both of these factors, we cannot

be certain of the long-term impacts of this project. One alternative to the proposed activity is for the construction of the road to sub-base level be postponed and instead, this project be used to develop highly detailed design of the road to include asphalt level, this ESMP would be expanded to become an EIA to include all works to complete the road to an asphalt surface, develop a full detailed budget for the road, undertake any other feasibility studies needed and finalise the entire package into a procurement bid document. This package could then be used to source an adequate level of funding to complete the road construction to its final phase in one go.

In this scenario, a larger budget allocation would be given to the Paal and Mosral coastal defence upgrades to ensure that they are robust enough to secure the road for the next few years while the above takes place.

This alternative will require serious consideration by the project proponents should items (i) or (ii) above eventuate.

Elevating Coastal Road: This option is not considered appropriate given the predicted future impacts of climate change and the flooding risk of the low-lying coastal berm area at these sites. The costs of undertaking this would be significant, and it doesn't fall into line with the Kosrae States long term vision for climate resilient infrastructure as described in the Kosrae Shoreline Management Plan (KSMP). This ESMP and the CBA both agree that this is not a suitable alternative.

2.4 Land Requirements

The Malem to Utwe inland road passes through 86 parcels of land each of which requires an easement to be signed by the correct landowner and then registered with the Attorney General's office. The final alignment has been planned to avoid the resettlement of any residences on these land parcels. Ongoing consultations throughout the project planning and design stages continue to reinforce the landowners support of this activity and the confirmation that easements will be signed on a voluntary basis by landowners.

For any instances of objection to the routing of the road by landowners, the project team will in the first instances look to make small adjustments in the alignment to avoid any potential negative impacts on landowners. At this advanced stage in obtaining signed easements, there is only one case of an objection to the route which has been resolved by re-routing the road approximately 10m to the south around the landowner's boundary to avoid his garden area.

These land easements fall under the definition of voluntary donations as, according to the Adaptation Fund's principle on Involuntary Resettlement, the landowner has the right to refuse to sign without any repercussions or recrimination.

Component 2 will require the installation of water security interventions which are designed to be accessible to the entire community. It is anticipated that all interventions should be installed on government or communal lands on the island. However, if there are no suitable public lands, private lands may have to be used. If this is the case, the landowner would have to sign an easement to allow long term access to his lands for this purpose and also agree (depending on the type of intervention installed) to manage the land use around the intervention (as per the stipulations in this ESMP) to prevent contamination from, for e.g. pig pens.

At the project level it is important to note that, while not anticipated, if the national or state governments seek to use their legal rights to acquire the land of any landowner who refuses to sign an easement for any project activity, then this will be considered as involuntary resettlement and

the AF's principle on Involuntary Resettlement will be triggered and all the requirements of that principle will have to be implemented. The AF process for involuntary resettlement would be:

- 1) Provide justification for the need for involuntary resettlement by demonstrating any realistic alternatives that were explored, and how the proposed involuntary resettlement has been minimized and is the least harmful solution.
- 2) Describe in detail the extent of involuntary resettlement, including the number of people and households involved, their socio-economic situation and vulnerability, how their livelihoods will be replaced, and the resettlement alternatives and/or the full replacement cost compensation required whether the displacement is temporary or permanent.
- 3) Describe in detail the involuntary resettlement process that the project/programme will apply, and the built-in safeguards to ensure that displaced persons shall be informed of their rights in a timely manner, made aware of the grievance mechanism, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation. This also should include an overview of the applicable national laws and regulations.
- 4) Justify the conclusion that the involuntary resettlement is feasible.
- 5) Describe the adequacy of the project/programme organisational structure to successfully implement the involuntary resettlement as well as the capacity and experience of the project/programme management with involuntary resettlement.
- 6) Build awareness of involuntary resettlement and the applicable Principles and procedures of the project/programme.

3 Policy, Legal and Administration Framework

3.1 National and State Legislation

3.1.1 Environmental Legislation

The legal instruments that are the foundation of FSM's environmental safeguards legal regime are 'Federated States of Micronesia Environmental Protection Act 1999' and the 'Environmental Impact Assessment Regulations 1989'. National policy documents which contains provisions related to the principles and elements of the environmental safeguards are the 'Federated State of Micronesia's State-Wide Assessment and Resource Strategy 2010-2015+', 'Federates States of Micronesia's Strategic Development Plan 2004-2023' and 'Nation Wide Integrated Disaster Risk Management and Climate Change Policy 2013'.

The FSM Environmental Protection Act 1999 states that an Environmental Impact Assessment can only be carried out if a project is likely to have potential environmental risks and impacts.

Under Principle 1 of the Adaptation Fund Environmental and Social Policy (Compliance with the Law) the project activities were screened against the Environmental Protection Act and it has been determined that the water security and sanitation interventions under Component 2 do not require a separate environmental impact assessment as it is considered to be low risk with little to no adverse environmental impacts.

The 2016 EIS for Component 3 of the project concluded that the environmental impacts from the proposed inland road are low to moderate and can be adequately controlled, however subsequent assessment under this current ESMP has identified some moderate to significant potential impacts.

3.1.1.1 Environmental Framework for Kosrae

Kosrae has enacted legislation and prepared a range of resource and management plans to give effect to its responsibilities in relation to the management, protection and conservation of the environment and natural resources (KIRMA, 2014). These responsibilities are principally implemented by the Kosrae Island Resource Management Authority (KIRMA), a semi-autonomous government agency, which is mandated to: "protect the environment, human health, welfare and safety and to abate, control and prevent pollution or contamination of air, land and water by balancing the needs of economic and social development with those of environmental quality and adopting regulations and pursuing policies which, to the maximum extent possible, ensure that economic and social development is environmentally sustainable" (Kosrae State Code, Section 19.101).

Under Title 19 of the Kosrae State Code and the Regulations for Development Projects KIRMA have responsibilities and powers to administer a development permit system. Where a potential project may have significant impact on the environment, these regulations require an Environmental Impact Assessment (EIA).

This assesses the physical, ecological, aesthetic, cultural, economic, social, or health effects or impacts of a proposed activity on the environment, whether direct, indirect or cumulative. The Environment Impact Statement describes the potential effects or impacts on the environment in sufficient detail so as to allow the assessors (KIRMA, the Board of Commissioners, and stakeholders) to make a comparison of the alternatives that can be taken to avoid, minimize, rectify, reduce or eliminate, or compensate for the impact of the proposed activity. This assessment process concludes with a decision by the Board of Commissioners to issue a development review permit,

subject to conditions that will avoid, minimize or eliminate the effects or impacts of the proposed activity on the environment. The process is detailed in full in KIRMA's guidance document: Environmental impact assessment in the State of Kosrae, FSM (KIRMA, 2014). The project has completed all applicable EIA steps.

The road construction activity received no objections from the public and communities held in Malem and Utwe communities (June 2016). The KIRMA Board approved the EIS on the 15 September 2016 and a permit was issued with conditions, and there were no appeals to the decision. Subsequent to this and following the safeguards audit of the EIS and original ESMP in July 2019, a new permit will need to be applied for based on this updated ESMP.

The reconstruction of the coastal defences at Paal and Mosral (component 3.2) have been approved following consideration of the proposal and the initial environmental and social impact screening document, KIRMA advised that no specific EIS was needed for this activity. A permit from KIRMA will be required, and the application will be made based on this ESMP.

3.1.1.2 Earthworks Permit for Kosrae Road Construction

The design and future construction of the road will need to consider the following regulations which apply to the Kosrae inland road design and construction activity and state:

- 1) All earthmoving activities within the Federated States of Micronesia shall be conducted in accordance with these regulations and in such a way as to prevent accelerated erosion and accelerated sedimentation. To accomplish this, all persons engaging in earthmoving activities shall design, implement, and maintain erosion and sedimentation control measures which effectively prevent accelerated erosion and accelerated sedimentation. The erosion and sedimentation control measures must be set forth in a plan, must always be available and the site of the project, and must be filed with the FSM Department of Resources and Development.
- 2) The erosion and sedimentation control plan should be prepared by a person trained and experienced in erosion and sedimentation control methods and techniques. The erosion and sedimentation control plan should be prepared to prevent acceleration of erosion and acceleration of sedimentation and shall consider all factors which contribute to erosion and sedimentation, including, but not limited to the following: topographic and/or hydrographic features of the project area; the types, depth, slope and areas of the soils, coral and/or reef; the original state of the area as to plant and animal life; whether any coral reef which may be affected by the earth moving is alive or dead; the proposed alteration to the area; the amount of runoff from the project area; the staging of earthmoving activities; temporary control measures and facilities for use during earthmoving activity; permanent control measures and facilities for long term protection and; a maintenance program for the control facilities including disposal of materials removed from the control facilities or a project area.
- 3) The FSM Earthworks Regulations (section 2.3) provides control measures and facilities which shall be incorporated into all earthmoving activities.
- 4) A permit must be obtained from the FSM Department of Resources and Development before any earthworks commence for this project. Applications shall be on the prescribed form and shall be accompanied by an Erosion and Sedimentation Control Plan.

3.1.2 Other Legislations and Codes

Table 2: Summary of key regulations applicable to this project

Legislation	Applicability to Project
Kosrae State Code	Covers the state regulations pertaining to The Land Council, Environment, Land Development and Road Safety
Yap State Code	Cover the leases and use of public lands, protection of marine and water resources, environmental quality protection, land use controls and public health
Pohnpei State Code	Covers sanitary and toilet facilities for the state, construction of facilities, environmental protection, public land
Chuuk State Code	Covers health and sanitation, environmental protection and preservation and land management
FSM National Code	Provides national regulations for historical sites and antiquities, public health safety and welfare and labour

3.2 Adaptation Fund Safeguard Policies

The Adaptation Fund Environmental and Social Safeguard Policy requires that all projects be screened for their environmental and social impacts, that those impacts be identified, and that the proposed project be categorised according to its potential environmental and social impacts. Regardless in which category a project is screened, all environmental and social risks shall be adequately identified and assessed by the IE in an open and transparent manner with appropriate consultation.

The scope of the environmental and social assessment shall be commensurate with the scope and severity of potential risks. The assessment should assess all potential environmental and social risks and include a proposed risk management plan, or in this case an Environmental and Social Management Plan.

All projects supported by the AF shall be designed and implemented to meet the ESS Policy principles, although it is recognised that depending on the nature and scale of a project not all principles will be relevant to every project.

Initial safeguards screening was undertaken in 2016 and was subsequently audited in July 2019 where several discrepancies between the AF ESS Policy and assessment were identified. Updated screening has been carried out in accordance with the AF ESS policy and the policy guidance document. This updated ESMP is the safeguard instrument for the FSM AF project's technical and physical investments.

SPREP also implements all projects according to their own Environmental and Social Safeguards Policy through a series of 'Environmental and Social Standards'. As an Implementing Entity for AF, SPREP are in the process of auditing and updating their ESS to ensure that they comply with and fully encompass the AF policy. The table below highlights the SPREP standards in relation to the AF principles.

Table 3: Adaptation Fund Safeguard Principles assessment against project activities

AF & SPREP ESS Principles	Applicability	Applicability to Project
<p>Principle 1: Compliance with the Law <i>Projects/programmes supported by the Fund shall be in compliance with all applicable domestic and international laws.</i></p> <p>SPREP Social and Environmental Policy (Clause 3)</p>	<p>The IE will ensure that the project will comply with the applicable domestic and international law. Needs a description of the regulatory framework for any project activity that may require permits.</p> <p>This principle always applies to all AF funded projects.</p>	<p>Permits will be needed for the following activities: Coastal reinforcements (Kosrae) Earth works (Kosrae)</p> <p>The following regulations are applicable for this project:</p> <ul style="list-style-type: none"> • Kosrae State Code • Kosrae Regulations for Development Projects • FSM Earthmoving regulations • FSM Labour Act • Yap State Code • Pohnpei State Code • Chuuk State Code • FSM National Code • Basel and Waigani Convention • Convention on Biological Diversity
<p>Principle 2: Access and Equity <i>Projects/programmes supported by the Fund shall provide fair and equitable access to benefits in a manner that is inclusive and does not impede access to basic health services, clean water and sanitation, energy, education, housing, safe and decent working conditions, and land rights. Projects/programmes should not exacerbate existing inequities, particularly with respect to marginalized or vulnerable groups.</i></p> <p>SRPEP Principle 1: Human Rights</p>	<p>The process of allocating access to project benefits should be fair and impartial. A fair process treats people equally without favouritism or discrimination, and an impartial process treats all rivals or disputants equally. Furthermore, the project will be designed and implemented in a way that will not impede access of any group to the essential services and rights mentioned in the principle.</p>	<p>The exact sites for installation of water security interventions in Yap, Chuuk and Pohnpei are not yet determined. Under this principle, the guidelines state that allocating access to Project benefits should be fair and impartial. If the site selection and consultation process of Component 2 is not carefully planned, then there is the risk that there may be bias and therefore lack of access and equity to the improved water resources</p> <p>To demonstrate compliance with this principle, the ESMP describes the process of allocating and distributing the Component 2 interventions and by showing how this process ensures fair and impartial access to benefits. One risk of fair access is the installation of interventions on private land without securing long term access to the interventions. Risks of this type are addressed in this ESMP.</p>
<p>Principle 3 – Marginalised and Vulnerable Groups. <i>Projects/programmes supported by the Fund shall avoid imposing any disproportionate adverse impacts on marginalized and vulnerable groups including children, women and girls, the elderly, indigenous people, tribal groups, displaced people,</i></p>	<p>Impacts on marginalised and vulnerable groups must be considered so that such groups do not experience adverse impacts from the project that are disproportionate to those experienced by others.</p>	<p>This principle is not triggered by the project as there are no disproportionate adverse impacts foreseen from the various components due to the triggering of Principle 2.</p>

<p><i>refugees, people living with disabilities, and people living with HIV/AIDS. In screening any proposed project/programme, the implementing entities shall assess and consider particular impacts on marginalized and vulnerable groups.</i></p> <p>SPREP Principle 1: Human Rights SPREP Principle 3: Child Protection SPREP Safeguard 1: Assessment and Management of Environmental and Social Risks and Impacts (requirement 3)</p>		
<p>Principle 4 – Human Rights <i>Projects/programmes supported by the Fund shall respect and where applicable promote international human rights.</i></p> <p>SPREP Principle 1: Human Rights</p>	<p>Promotion of human rights in the project will be achieved by creating awareness with all involved in the project operations, including design, execution, monitoring, and evaluation, about the Universal Declaration of Human Rights as an overarching principle in the implementation of the project.</p>	<p>This principle is triggered by all projects funded by AF.</p> <p>The AF bases this principle on the United National Declaration of Human Rights and requires that at a minimum, and regardless of whether the country is a Party to them, the nine-core international human rights treaties will be monitored.</p> <p>The project will adhere to this principle through contractual clauses with any contractors and through oversight by the IE</p>
<p>Principle 5 – Gender Equality and Women’s Empowerment <i>Projects/programmes supported by the Fund shall be designed and implemented in such a way that both women and men 1) have equal opportunities to participate as per the Fund gender policy; 2) receive comparable social and economic benefits; and 3) do not suffer disproportionate adverse effects during the development process.</i></p> <p>SPREP Principle 2: Gender Equality</p>	<p>Gender equality refers to the equal rights, responsibilities, opportunities and access of women and man and boys and girls as well as the equal consideration of the respective interests, needs, and priorities. To ensure gender equality, measures often need to be taken to compensate or reduce disadvantages that prevent women and men from otherwise operating on an equitable basis. Gender equality and women’s empowerment must be applied in the project design and its implementation regardless of the legal and regulatory framework in which the project is set.</p>	<p>There are known links between water supply, WASH and the role of the females in the house. It is therefore critical to ensure that ongoing consultation is undertaken with a fair gender representation throughout project implementation.</p> <p>The ESMP identifies key stakeholders or key stakeholder groups for women’s representation in consultations; provides specific instruct the implementation team to include woman in all future consultations; includes parameters for monitoring gender equality and women’s empowerment in the ESMP monitoring plan.</p>
<p>Principle 6 – Core Labour Rights <i>Projects/programmes supported by the Fund shall</i></p>	<p>The International Labour Organisation (ILO) core labour standards are stated in the 1998 ILO Declaration of Fundamental</p>	<p>This principle is applicable for all AF projects.</p>

<p><i>meet the core labour standards as identified by the International Labour Organisation.</i></p> <p>SPREP Safeguard 4: Labour and Working Conditions</p>	<p>Principles and Rights at Work. Regardless of whether the countries where the AF's projects are implemented have ratified the conventions, in the context of AF funded projects the IE will respect, promote and realise in good faith the principles of the ILO and ensure that they are respected and realised in good faith by the EE and other contractors.</p>	<p>As FSM has not ratified the ILO, the ESMP demonstrates how the ILO core labour standards will be incorporated in the design and the implementation of the project as appropriate.</p> <p>The project will adhere to this principle through contractual clauses with any contractors and also through oversight by the IE.</p>
<p>Principle 7 – Indigenous People <i>The Fund shall not support projects/programmes that are inconsistent with the rights and responsibilities set forth in the UN Declaration on the Rights of Indigenous Peoples and other applicable international instruments relating to indigenous peoples.</i></p> <p>SPREP Safeguard 9: Indigenous Peoples</p>	<p>This policy is applied with the project affects, directly or indirectly, indigenous people.</p>	<p>Most of the population of the project sites are indigenous, in the sense of having ancestral attachment to their land which is still important in the livelihoods of the majority who are rural dwellers. This reliance on natural resources and both customary and legal rights are recognised under Federal and State.</p> <p>As Indigenous Peoples are the overwhelming majority of direct project beneficiaries safeguard measures should be integrated into the project's overall design through the ESMP. They include: (i) Free, prior, and informed consultation leading to broad community support during project preparation; (ii) Measures to ensure culturally appropriate processes and benefits; (iii) Measures to ensure that adverse impacts are mitigated and (iv) Measures for disclosing key project documents in a language understandable to them.</p> <p>Community consultation and regular engagement with the community is integral and the ESMP stipulates that this will be undertaken through the life of the project.</p>
<p>Principle 8 – Involuntary Resettlement <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids or minimizes the need for involuntary resettlement. When limited involuntary resettlement is unavoidable, due process should be observed so that displaced persons shall be informed of their rights, consulted on their options, and offered technically, economically, and socially</i></p>	<p>This policy refers to both physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood). Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in physical or economic displacement because of either: 1) lawful expropriation or temporary or permanent</p>	<p>Component 2 will require the installation of water security interventions which are designed to be accessible to the entire community. It is expected that all interventions should be installed on government or communal land on the islands. However, if there are no suitable public lands, private lands may have to be used. If this is the case, the landowner would have to sign an easement to allow long term access to his lands for this purpose and also agree (depending on the type of intervention installed) to manage the land use around the intervention to prevent contamination from, for e.g. pig pens. This easement will only be entered on a voluntary donation basis.</p>

<p><i>feasible resettlement alternatives or fair and adequate compensation.</i></p> <p>SPREP Safeguard 7: Land Acquisition and Involuntary Resettlement</p>	<p>restrictions on land use, and 2) negotiated settlements in which the buy can resort to expropriation or impose legal restrictions on land use if negotiations with the seller fail. This principle does not apply to resettlement resulting from voluntary land transactions in which the seller is not obligated to sell, and the buyer cannot resort to expropriation or other compulsory processes sanctioned by the legal system of the host country if negotiations fail.</p>	<p>For component 3, it is expected that all 83 easements will be through voluntary donation as defined in this principle.</p> <p>If any state or national government seeks to use their legal rights to acquire the land of any landowner who refuses to sign an easement, this will be considered as involuntary resettlement and this principle will be triggered and all the requirements of this principle will have to be implemented.</p> <p>The AF process for involuntary resettlement would be:</p> <ol style="list-style-type: none"> 1) Provide justification for the need for involuntary resettlement by demonstrating any realistic alternatives that were explored, and how the proposed involuntary resettlement has been minimized and is the least harmful solution. 2) Describe in detail the extent of involuntary resettlement, including the number of people and households involved, their socio-economic situation and vulnerability, how their livelihoods will be replaced, and the resettlement alternatives and/or the full replacement cost compensation required whether the displacement is temporary or permanent. 3) Describe in detail the involuntary resettlement process that the project/programme will apply, and the built-in safeguards to ensure that displaced persons shall be informed of their rights in a timely manner, made aware of the grievance mechanism, consulted on their options, and offered technically, economically, and socially feasible resettlement alternatives or fair and adequate compensation. This also should include an overview of the applicable national laws and regulations. 4) Justify the conclusion that the involuntary resettlement is feasible. 5) Describe the adequacy of the project/programme organisational structure to successfully implement the involuntary resettlement as well as the capacity and experience of the project/programme management with involuntary resettlement. 6) Build awareness of involuntary resettlement and the applicable Principles and procedures of the project/programme.
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<p>Principle 9 – Protection of Natural Habitats <i>The Fund shall not support projects/programmes that would involve unjustified conversion or degradation of critical natural habitats, including those that are (a) legally protected; (b) officially proposed for protection; (c) recognized by authoritative sources for their high conservation value, including as critical habitat; or (d) recognized as protected by traditional or indigenous local communities.</i></p> <p>SPREP Safeguard 8: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p>The CBD defines a ‘habitat’ as the place or type of site where an organism or population naturally occurs. ‘Critical natural habitat’ refers to habitats that are not man-made and that fulfil a critical role for an organism or a population that in the absence or disappearance of that habitat might be severely affected or become extinct. The IE will identify: 1) the presence in or near the project area of natural habitats, and 2) the potential of the project to impact directly, indirectly or cumulatively upon natural habitats.</p>	<p>Under the AF definitions in this principle, ‘natural habitats’ are within the Kosrae inland road construction footprint but none of these are considered to be ‘critical natural habitats’. Under the Kosrae Land Use Plan the road alignment passes through ‘Areas of Particular Concern’ and ‘Special Consideration Districts’.</p> <p>This ESMP describes these areas, explains why they cannot be avoided and discusses the potential impacts. For each affected critical natural habitat, provide an analysis on the nature and the extent of the impact including direct, indirect, cumulative, or secondary impacts; the severity or significance of the impact; and a demonstration that the impact is consistent with management plans and affected area custodians.</p>
<p>Principle 10 – Conservation of Biological Diversity <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids any significant or unjustified reduction or loss of biological diversity or the introduction of known invasive species.</i></p> <p>SPREP Safeguard 5: Biodiversity and Ecosystem Services SPREP Safeguard 8: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p>The IE will use the CBD definitions of biological diversity to identify: 1) the presence in or near the project area of important biological diversity; 2) potential of a significant or unjustified reduction or loss of biological diversity, and 3) potential to introduce known invasive species.</p>	<p>Under the definition of the AF, biological diversity concerns not only living organisms of all taxa but also ecosystem processes, habitats, hydrological cycles, processes of erosion and sedimentation, landscapes, etc.</p> <p>Additionally, the ESMP makes the connection between the Kosrae road construction and the potential impacts on marine biodiversity through poor erosion control, describes the marine habitat, the scale of the potential marine impacts and any protective measures that are required.</p> <p>The areas of upland forest which will need to be cleared through the future Kosrae road realignment plan can be considered important biological diversity. There will be loss of this biodiversity through clearance and the potential to introduce invasive species through these works.</p> <p>As required in the principle, this ESMP describes the elements of known biological diversity importance in the road alignment and describes why the impacts cannot be avoided and what measures will be taken to minimise these impacts.</p> <p>The ESMP also provides practical avoidance or protective measures to minimise the impacts.</p>

<p>Principle 11 – Climate Change <i>Projects/programmes supported by the Fund shall not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.</i></p> <p>SPREP Principle 4: Climate Change</p>	<p>The main drivers of climate change that are considered here are the emission of carbon dioxide gas from the use of fossil fuel and from changes in land use, methane and nitrous oxide emissions from agriculture, emission of hydrofluorocarbons, perfluorocarbons, sulphur hexafluoride, other halocarbons, aerosols, and ozone.</p>	<p>Not applicable to this project</p>
<p>Principle 12 – Pollution Prevention and Resource Efficiency <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that meets applicable international standards for maximizing energy efficiency and minimizing material resource use, the production of wastes, and the release of pollutants.</i></p> <p>SPREP Safeguard 5: Resource Efficiency and Pollution Prevention</p>	<p>There are two distinct aspects to this principle. Project shall on the one hand minimise in a reasonable and cost-effective way the resources that will be used during implementation. This applies to all sources and forms of energy, to water, and to other resources and materials inputs. On the other hand, the project will minimise the production of waste and the release of pollutants.</p>	<p>Component 3 has the potential to produce pollution and the contractor will be required to produce a ‘Waste and Pollution Prevention Management Plan’ as detailed in the AF ESS guidelines.</p> <p>Component 2 may require the production of concrete for any construction work during installations and this ESMP provides the measures that must be implemented to avoid spillage and pollution.</p>
<p>Principle 13 – Public Health <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids potentially significant negative impacts on public health.</i></p> <p>SPREP Safeguard 6: Community Health, Safety and Security</p>	<p>Possible public health impacts of a project can be determined by assessing its impact on a range of so-called determinants of health. Public health is determined not just by access to medical care and facilities and lifestyle choices, but also by a much broader set of social and economic conditions in which people live.</p> <p>The project may demonstrate that it will not cause potentially significant negative impacts on public health by screening for possible impacts and including the results of the screening. The outcome of the screening should be used to demonstrate compliance with the principle if there are no potentially significant negative impacts on public health are likely.</p>	<p>There are clear impact risks during the component 3 construction activities and operational phase from movement of construction machinery, changes in traffic patterns through the village and potential increase in sediment loading in the village streams and coastal environment, etc.</p> <p>There are also potential public health impacts from the water security interventions in component 2 and this ESMP provides mitigation measures and strategies.</p>
<p>Principle 14 – Physical and Cultural Heritage</p>	<p>The IE will identify the presence of cultural heritage in or near the project.</p>	<p>The nature of the known cultural sites along the Kosrae road alignment have been identified and described in the EIS. The EIS</p>

<p><i>Projects/programmes supported by the Fund shall be designed and implemented in a way that avoids the alteration, damage, or removal of any physical cultural resources, cultural sites, and sites with unique natural values recognized as such at the community, national or international level. Projects/programmes should also not permanently interfere with existing access and use of such physical and cultural resources.</i></p> <p>SPREP Safeguard 10: Cultural Heritage</p>		<p>also provides a chance find procedure for discovery of any as yet unknown cultural site.</p> <p>The ESMP includes the chance find procedure and includes measures to be taken during construction to protect these known and as yet unknown sites.</p>
<p>Principle 15 – Lands and Soil Conservation <i>Projects/programmes supported by the Fund shall be designed and implemented in a way that promotes soil conservation and avoids degradation or conversion of productive lands or land that provides valuable ecosystem services.</i></p> <p>SPREP Safeguard 8: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p>	<p>This principle concerns the stewardship of land to either be maintained in its natural state where possible, or if it is converted to promote and protect its functioning. Soil conservation refers to a set of measures to prevent, mitigate or control soil erosion and degradation. There are two aspects to the principle: promotion of soil conservation and avoidance of degradation or conversion of valuable lands. This applies to soils and lands directly affected by the project as well as those influenced indirectly, or as a secondary or cumulative effect. Soil conservation should be incorporated in project design and implementation.</p> <p>The IE will identify: 1) productive lands and/or lands that provide valuable ecosystem services within the project area. If such land exists, the IE will identify and describe: the lands; project activities that may lead to land degradation; reasons why using these lands is unavoidable and the alternatives that were assessed, and; measures that will be taken to minimise productive land</p>	<p>This principle is applicable to the Kosrae road design activity.</p> <p>The soil conservation portion of this principle requires projects to have good erosion and sedimentation controls in place. As this is an important part of the Kosrae State regulations, this is covered in detail in the EIS and an Erosion and Sedimentation Control Plan has been developed for this activity.</p> <p>This ESMP applies the requirements of this principle including analysis of alternatives, measures to minimise degradation or ecosystem service impacts.</p>

	degradation or ecosystem service impacts.	
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3.2.1 Gender Action Plan

Gender is a strategic priority of the Adaptation Fund and all projects and implementing partners shall strive to uphold women’s rights as universal human rights and to attain the goal of gender equality and equal treatment of women and men, including equal opportunities for access to Fund resources and services, in all Fund operations through a gender mainstreaming approach.

The AF’s gender policy has the following objectives:

- i. To ensure that the AF will achieve more effective, sustainable and equitable adaptation outcomes and impacts in a comprehensive manner in both its internal and external procedures;
- ii. To provide women and men with an equal opportunity to build resilience, address their differentiated vulnerabilities, and increase their capacity to adapt to climate change impacts; recognizing the need for targeted efforts in order to ensure women’s participation;
- iii. To address and mitigate against assessed potential project/programme risks for women and men in relation to concrete adaptation actions financed by the AF;
- iv. To contribute to addressing the knowledge and data gaps on gender-related vulnerabilities and to accelerate learning about effective gender-equal adaptation measures and strategies; and
- v. To consult with affected women and men actively, considering their experiences, capabilities and knowledge throughout the AF processes.

5 Stakeholder Engagement

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

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 the project, 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 this project, stakeholder groups will vary across the project activities and sites. Stakeholders 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 impact area 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

Primary stakeholder groups applicable to the project are listed and described below.

Category	Group	Relevance
National Government	Department of Environment, Climate Change & Emergency Management (DECEM)	Environment Division: This division is responsible for conservation, protection and sustainable utilisation of living and non-living natural resources. Climate Change Division: This division is responsible for management and coordination of FSM's measures and response to the threats and impacts of climate change.
Local Governance	Chuuk Department of Public works, Disaster Office	
	Yap EPA, Yap Budget and Planning	
	Pohnpei Department of Transportation and Infrastructure	
	Kosrae Governor's Office	Responsible for management of government lands
	Kosrae Island Resource Management Authority	Responsible for issuing environmental development consents
	Kosrae Department of Transport and Infrastructure	Responsible for Kosrae Roads design, construction and maintenance
	Kosrae Office of Development Assistance	

Category	Group	Relevance
	Municipality Councils and Traditional Leaders	
	Village Mayors	
Local Groups and NGOs	Kosrae Historic Preservation Office	Responsible for identifying, protecting and managing areas of cultural and historical importance on Kosrae.
	Kosrae Conservation and Safety Organisation	Tuvalu Association of NGOs (TANGO) provides a policy voice within government and provides information and communication to its 48 members and the local community.
	Women's Groups	Island representatives of the Chuuk Women's Council, Yap Women's Associations, Pohnpei Women's Council and the Kosrae Women Association
	Disabled Persons Organisations (DPO)	Pohnpei Consumers Organisation (PCO) whose mission it is to protect and promote the human, civil and legal rights of individuals with disabilities through the provision of information and advocacy. The PCO was the founding DPO in FSM and there now a DPO in each state coordinated by the newly formed National Coalition of DPOs.
	Youth Groups	The FSM Youth Council serves as an umbrella organisation for all FSM state youth clubs and youth councils while providing a bridge between national government and the youth.
	Island Church Groups	Representatives of the main church groups on each of the islands
Project Affected Communities and Individuals	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 have been addressed and incorporated into management measures where appropriate throughout the ESMP. For subsequent consultations, the EE will be responsible for taking any comments forward to either the IE or the Contractor for incorporation. Minutes of consultations and actions taken based on those comments will be included in project reporting.

5.3.1 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 EE will be responsible for early consultations and engagement, but once construction starts, The Kosrae DTI, the KIRMA Project Officer and any contractors will also have engagement responsibilities, primarily around the strengthening of Kosrae coastal developments and the installation of water security interventions.

Table 4: Stakeholder Engagement and Consultation Implementation Plan

No	Project Activity	Timetable	Objective	Stakeholders	Medium
A: Water Security Interventions					
A1	Selection of installation sites	From project preparation through to final selection.	Identify and select sites for installations/upgrades which adhere to the safeguards requirements and have community support	Local Governance: Yap, Chuuk Pohnpei Local groups and NGOs: Yap, Chuuk, Pohnpei Village leaders and communities	One-on-one meetings Group meeting with refreshments Structured group meeting with refreshments
A2	Disclosure of the ESMP	On completion of ESMP	To disclose ESMP	All identified	Public flyer, radio announcement, website, hard copies.
A3	Commencement of Works	Two weeks before commencement of any works.	To reconfirm ongoing consultation, feedback and GRM processes	Island Councils Women's Groups Community Site occupants	Community Notice Boards Community Meeting
B: Kosrae Road Design					
B1	Disclosure of ESMP	On completion of ESMP	To disclose ESMP	All identified	Public flyer, radio announcement, website, hard copies.

No	Project Activity	Timetable	Objective	Stakeholders	Medium
C: Kosrae Coastal Defences					
C1	Disclosure of ESMP	On completion of ESMP	To disclose ESMP	All identified	Public flyer, radio announcement, website, hard copies.
C2	Commencement of Works	Two weeks before commencement of any works.	To advise of construction schedule, reconfirm management measures and remind of GRM process	Island Councils Women's Groups Community Site occupants	Community Notice Boards Community Meeting

5.3.2 Resources and Responsibilities

The implementation of the SECP will be the overall responsibility of the EE, with support from the State Governments and Contractors as required. The EE Project Manager will be responsible for arranging and facilitating the meetings as it appropriate and they 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 Project Manager 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 to Date

Consultations of key stakeholders at state, municipal and public levels has been undertaken as part of the development of the Kosrae Environmental Impact Statement and this ESMP. Safeguard specialist led consultations have been undertaken for the road construction EIS, ESMP and KIRMA development consent as well as coastal defences works on Kosrae. Project Manager led consultations have been undertaken for the water security interventions on Yap, Chuuk and Pohnpei. These build on similar state, municipal and public consultations conducted during the development for this proposal and during the updating of the KSMP in 2013/14 for the State of Kosrae.

Several consultations were undertaken in all four states and discussed and identified environmental and social issues and risks of the project which have been addressed in this ESMP.

In Kosrae, during the EIS process, a presentation and discussion of the project was conducted with firstly, the Mayor and Council Members of both Utwe and Malem Municipalities, and immediately following this, an open public meeting in each Municipality, again also attended by the Mayors and Council Members. Following the presentation, clarifications and discussion around issues were conducted around large scale maps of the project area showing the key Kosrae components. Discussions and issues identified, including changes to the project design were captured in the EIS.

During the development of this ESMP, a safeguards consultation session was conducted on Kosrae with key governance and community stakeholders with a presentation on the additional impacts

identified and to get additional input on the proposed management measures. Discussions and issues identified have been captured in this ESMP.

5.5 Public Disclosure

In Kosrae, KIRMA determines whether a public hearing or consultation is required for any project application. As outlined in Kosrae's EIA process, the draft EIS is generally circulated to all State stakeholders and made available for public consultation. Stakeholders and the community have a minimum of 30 days to provide comments on the proposal. This was completed in 2016 and a final and completed EIS was endorsed.

This ESMP captures the recommended measures in the EIS and will be publicly disclosed in all project locations. This ESMP will be made available in hard copy in all village council offices.

5.6 Grievance Redress Mechanism

Any parties wishing to raise grievances caused by or associated with the project will be able to do so. In the first instance grievances will be managed by the PMU. Depending on the nature of the complaints, or if for any reason the complainant is unwilling to make a report to the PMU, it can submit a complaint through the Municipality Councils and/or traditional leaders.

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.

Community level grievances are most likely with the proposed project.

The following process 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 village council who will likely liaise directly with the Contractor, DTI or project team leader (Kosrae) or the Project Manager directly (Yap, Chuuk or Pohnpei). 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 Project Manager.

At all times it is the responsibility of the Project Manager to record, manage and close all grievances. Management of grievances may include issuing instructions to the relevant party 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 Project Manager with the details who will then record the matter.

For concerns such as damage to trees or food gardens, etc., the AP will discuss this with the council, who will then raise the matter immediately with the offending party or their supervisors, 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 Project Manager 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 Project Manager 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 village council or other third party; directly to the Contractor or project team; 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 Project Manager 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 by the Project Manager to the IE, SPREP.

All grievances received and handled will be reported by DECEM to SPREP as the IE via periodic reporting. SPREP will review the handling of grievances to ensure they have been handled correctly.

The five-step grievance management process will be applied to the project by the following process:

Table 5: Grievance Redress process in tabulated form

Step	Application/How	Responsibility
Publicise the process	Develop a procedure which explains how the grievance mechanism will work on the specific project site	SPREP, DECEM
	Present the grievance mechanism at a public meeting help with affected communities	DECEM, EPA Yap, Chuck, Pohnpei; KIRMA Kosrae
Receive and register	Identify locations to receive grievances and ensure accessibility to all affected stakeholders	DECEM, EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Recognise that some grievances may be submitted in writing while others will be communicated verbally. All grievances are to be treated with the same level of seriousness and respect.	
	Log all complaints into a database	
Review and investigate grievances	Review and investigate grievances	EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Explain the process and the timeframe for the GRM process	
	Appoint an appropriate person to obtain information and investigate.	
Develop resolution options, response to grievances and closeout	Develop a proposed resolution process, involving communities where appropriate	State level – EPA Yap, Chuuk, Pohnpei; KIRMA Kosrae
	Implement the agreed solution	DECEM
	Follow-up with complainant to ensure satisfaction	
	If unsatisfied: Discuss further options. Identify local partners	

	who might be able to assist in finding solutions	
	If still unresolved, refer matter to third-party mediation or external review.	
Monitor and Evaluate	Regularly monitor the number and type of grievances received, resolved and outstanding	DECEM, SPREP
	Evaluate trends over time and stages of project development	
	Report all grievances to the SPREP via relevant periodic reporting	DECEM

SPREP will also maintain an email based grievance mechanism, so that the public can also lodge grievances directly to SPREP, should they wish to do so. Lodgment of grievances will follow the processes set out in the SPREP Fraud Manual (See website here: <http://www.sprep.org/corporate-documents/sprep-fraud-manual>).

The overall GRM for the project described above is complimented by the Kosrae EIA process which enables members of the public to make submissions and to raise issues that will be considered by the KIRMA Board prior to any decision on a Development Project application, as has been issued for component 3 activities of the project. In addition, anyone affected by the decision of KIRMA also has the right to request review of the decision under the Administrative Procedures Act (Title 2 Chapter 4), which includes agency review and further rights of appeal to the Kosrae State Court and Supreme Court of the FSM.

6 Environmental and Social Impacts

The project has the potential to create a variety of impacts through the implementation of the activities described in Section 2. These potential impacts can either be positive or negative depending on the receptors involved and the activity. The impact of this project on the physical, biological and social environment has been assessed to determine likelihood and identify effective mitigation measures.

There are site-specific and component specific impacts which have been identified and of those identified, only moderate to major impacts requiring specific mitigation are discussed below. All impacts (including minor) are addressed through mitigation measures included in the management plans in Section 7.

Impacts below are presented under the associated impact generating activity.

6.1 Water Security Investments Under Component 2

The following potential significant impacts have been identified in relation to activities under this component which provides for the installation and/or repair of rainwater harvesting systems, groundwater wells and self-composting toilets.

6.1.1 Social Impacts

6.1.1.1 *Installation on private lands*

1. Installation of any physical interventions on privately owned land carries the risk of limiting access if the landowner chooses to query or dispute the use of his land once the project is completed.
2. In addition to this, any interventions which involve community access to improved ground water wells on private land carry with it the need for landowner to agree to long term management of the land surrounding the wells to avoid contamination of the water source. For example, placement of pig pens, waste collection pit latrines, etc., placed near the well head has the potential to introduce contaminated leachate into the water source.

Protective measures

- Avoid installation or upgrades of any community water supply on private land.
- If private land is needed, easements signed and submitted with any private land owners prior to the commencement of any works. Easement should include provisions to manage or relinquish the land within a 30m circle around the well head to minimise the risk of contamination.
- Consultations with the land owners to be documented to demonstrate that any land owners have been made aware of the land use restrictions around any community ground water supply on their land.

6.1.1.2 *Collection of ground water*

1. Some methods of collecting water from well heads have the potential to contaminate both the water collected and the water in the well. If the collecting scoop is stored on the ground around the well, it has the potential to collect pathogens or contaminants from the soil surrounding the well head. This then has the potential to transfer into the ground water or into the water that has been collected creating a public health risk.
2. Some existing wells are in a neglected state or were poorly designed and constructed leading to difficult in access and poor hygiene standards around the well.

3. Solar or electrical pumps are often used as a way to extract water from wells without having to 'touch' the water with a contaminated bucket or scoop. Pumps introduce a risk to the use of the well as they will inevitably break down and are often not able to be replaced or repaired in the Pacific Islands meaning communities will revert back to the bucket or scoop. Technical stakeholders to the project have strongly recommended not to use any electrical pumps.

Protective measures:

- No electrical pumps to be installed under this project.
- Use the Kiribati designed 'Tamana' pump to extract water. This pump required no electrical motor and is built from various sizes and lengths of PVC piping. This design is widely used throughout Kiribati to extract water with a great degree of success. The Tamana Pump's basic components are 25mm PVC pip, usually up to 30m long; a 50mm PVC pipe, 1m long; 1 25mm to 50mm, 45o PVC reducer bend; a 25mm elbow; a 25mm PVC male adaptor; a foot valve; and, a piston made of one-half in PVC piping⁴.
- Project will support activite to upgrade structure of the wells walls and cover the well heads to provide safe, easy access to the water via the Tamana pump.

6.1.1.3 *Design of Self Composting Toilets*

1. If SCT are designed in such a way to allow too much light into the toilet itself the result is an over-use of bulking agent⁵ to cover the sight of human waste. Overuse of the bulking agent will result in a poor compositing process, drying out of the pile and an increased effort to source and refill the bulking agent container. Additionally, the idea of using the SCT is not attractive to many users if they can see the waste pile as it gives the impression of sitting on top of someone else's business. Designs of SCT in the Pacific Islands have frequently neglected this aspect of design.⁶
2. Design of SCT toilets usually call for the use of wood and or plywood which frequently become infested with termites and then deteriorate quickly.
3. A key element in the success of a SCT is the free availability of a bulking agent. Bulking agents provide a dry high carbon source which is critical for the composting process. A significant problem with SCTs in the Pacific Islands has been to find a free bulking agent to use with the toilets. Where no bulking agent is used, the toilet won't work well, will likely smell and the composting process is disrupted. People are likely to abandon SCT if they do smell. Most SCT deigns used in the Pacific Islands are based on a NZ or Australian model which used sawdust as the bulking agent. This is often not available in an atoll island. Casuarina needles have been used in Kiribati but may not be available in the project sites. Another source of bulking agent is coconut husk fibers which are pulled out, so it is very loose. This option might create an additional burden on women who are likely to be the ones responsible for maintaining and cleaning the SCTs. A third option for the project sites is dry brown leaf litter which is often swept up during yard cleaning activities and may be both abundant and require little additional effort to collect. A bucket of brown leaf litter can last several weeks if properly applied.
4. If the SCT is designed with a urine separation facility which can either drain into plants or be collected in a container for use as a soil conditioner. Urine is sterile, not normally containing

⁴ <http://www.unep.or.jp/ietc/Publications/TechPublications/TechPub-8d/kiribati1.asp>

⁵ Bulking agent is a dry high carbon material (such as sawdust or leaf litter) which provides carbon to mix with the high mitrogen of human waste. This ensures that proper composting can take place.

⁶ Compost Toilets and the Potential for use in the Pacific Islands, SPC, April 2017

pathogens, so it is safe to handle but often smells strong due to the ammonia in it and is not pleasant to have within a community.

Protective measures:

- Ensure the waste pile is some distance below the toilet seat and that little light is getting in so that it is hard to see into the toilet. The design should use a pedestal with a round hole at the lower end rather than a toilet seat placed onto a box.
- Treated wood shall be used to minimize risk of termite infestation.
- Consultations with the communities to discuss their preferred bulking agent and also raise awareness of the likely additional workload and importance of using this bulking agent. All consultations to be undertaken in such a way to ensure meaningful input by women.
- Consider providing the communities with wood chipper machines to assist with bulking agent and provide training on the use and maintenance of these machines.
- Banana circles planted close to the toilet to take the urine drain and process the leachate from the toilet is a very effective and sanitary solution
- The SCT designers should be required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites.

6.1.1.4 *Use and Maintenance of Self Composting Toilets*

1. Maintenance of the SCT will often fall to women to undertake creating an additional burden on their workload.
2. All known pathogens (including Round Worm) will die outside the human body within 2 years in the Pacific Islands. Poor maintenance of SCTs will lead to pathogens remaining active in the mix. Poor maintenance of the SCT includes lack of bulking agent availability, lid not being kept closed and chamber not being emptied according to schedule.
3. Poor maintenance of SCTS will also lead to the toilets being abandoned due to lack of cleanliness and bad smells.
4. Not all SCTs are designed to house compost for 2 years in the chamber, therefore secondary processing in a separate container is required to make the compost sanitary and kill all pathogens. This requires the compost to be in a healthy state in the first instance before it is transferred, otherwise the secondary process will not be effective. The longer the compost remains in the toilet chamber the better, but it should be for at least 6 months to ensure that it is safe to handle (with sanitary precautions). The secondary processing site is vulnerable to run off, rodent access or public access (public health issues) if it is not contained in a secure manner.
5. The 2 year old compost can be used on tree crops. The compost should not be used directly on vegetable crops as there is a potential risk of food contamination if the compost has not been correctly processed.

Protective measures:

- Detailed training on the need for and correct method of SCT construction and maintenance should be given to both men and women. Separate consultations should be held with women to get their input and opinion on the likely success of the SCT maintenance given that this will likely fall to them. Equal gender representation is important during trainings to ensure that men feel responsibility towards this task and do not see it as a 'women's job'. An understanding of local traditions and customs is needed for this as discussion of sanitary

matters is often 'tapu' and can be difficult to get input. A local language speaker should lead these trainings and discussions rather than any international representatives.

- Maintenance and monitoring of the secondary processing container needs to be undertaken to ensure that it is meeting all necessary standards for correct processing. The party/organisation responsible for maintenance and monitoring should be identified prior to construction.
- Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance of SCTs.
- Provide training on when and where to use the compost. Training should include: no use on food crops around harvesting time to provide additional time for any remaining pathogens to die off, after compost has been spread cover it with mulch to avoid the possibility of the compost drying to dust and being carried by the wind, it is best to dig the compost into the ground, do not use on ground being prepared for vegetable crops, do not apply directly on vegetable crops, if compost is fully matured and older than 3 years then all pathogens will be dead and the compost will be safe to use for any kind of agriculture.
- Ensure equal opportunities to apply to work on the construction of the SCTs is given to women.

6.2 Coastal Defence Upgrades in Kosrae

The following potential significant impacts have been identified in relation to activities under this activity which provides for the upgrade and improvement of coastal defence upgrades at Paal and Mosral on Kosrae.

6.2.1 Environmental Impacts

The screening of potential environmental impacts was conducted in May 2016 during the preparation of the EIS for the Kosrae road construction. Assessment was conducted with KIRMA and DTI staff. Initial screening of the potential environmental impacts as conducted using the KIRM Regulations for Development Project – Initial Environmental Assessment Checklist. Potential significant impacts and protective measures are discussed below.

6.2.1.1 Design of Revetment Works

1. Coastal defence works have the potential to cause downdrift erosion on adjacent shorelines at both Moral and Paal. At the southern end of the existing revetment at Paal the road curves inward with a wider coastal boulder protecting it. The shoreline position at this location is held by a small strand of reef flat mangroves. At Mosral, the current transition between the revetment and the beach is sharp which does not help to slow downward drift erosion. Kosrae has a standard for revetment design in the Kosrae Shoreline Management Plan which has been created to take account of re-using existing concrete rubble.
2. At the northern edge of the Mosral revetment works is a non-functional coastal outlet which has become damaged and over-washed creating standing water along the road side which floods upstream during heavy rain events. This damage has caused a loss of linkage in the design between the outflow and the revetment. It is likely that this outlet will need to be repaired as part of the road construction project which may result in the outlet design not complimenting the revetment design and creating additional problems down current.

Protective Measures

- Design of revetment shall include input from DTI engineers to ensure best practices design of the transition between the defence and the beach to the south.

- The revetment at Paal will extend behind the existing shoreline at this point to ensure that outflanking and downdrift erosion does not occur.
- The revetment at Mosral at the southern end will be constructed at a shallower slope and armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to the beach and help prevent downdrift and outflanking effects.
- Design of the revetments will include design of repairing the outflow at Mosral to ensure effective linkage between the two pieces of infrastructure.

6.2.1.2 Construction of Revetments

1. For both defence sections construction activities will take place from the edge of the road, over the beach that will underlie the revetment and on the immediate reef flats at the toe of the beach/defence. This has the potential to create an increased risk of sedimentation and erosion of the shoreline from the movement of heavy machinery.
2. Use of heavy machinery in the coastal environment brings with it the risk of fuel or oil spills into the marine environment.

Protective measures:

- The construction footprint on the reef flat will be minimised to no more than 10m in width from the toe of the beach/revetment and will not extend beyond the southern or northern extent of the proposed defence section.
- Access to the reef flat by the construction plant will be over the beach within the area of proposed defence reconstruction.
- At Paal additional care will be taken to ensure no heavy plant encroaches to or impacts on the root system of the mangrove strand that is located further seaward on the reef flat at the southern end of the proposed defence extent.
- Spill kits will be available on site during construction works and all staff members will be trained in their use.
- No refueling activities or storage of hazardous substances are permitted at the coastal construction site.

6.2.1.3 Ground Exposure

Exposed areas during reconstruction of the defences are related to natural sand, gravel and coral rubble materials that comprises the beach and coastal berm. Stirring of this material due to wave action at high tide is a natural occurrence with the size of sand, gravel and coral material resulting in it quickly falling out of suspension. Removing the existing emergency revetment armour material and re-grading the underlying beach will result in some additional localised suspended sediment in the water column at high tide. If properly controlled, this is not anticipated to be significant, will not be above natural occurring limited, and will not impact on sensitive coastal ecosystems such as coral and mangrove areas.

Protective measures:

- No burning of ground cover for clearing shall be practiced.
- No vegetation should be removed from the shoreline berm beyond the southern extent of the proposed defences at Paal and Mosral.
- Stockpiles of beach sand, coral rubble or rock armour will not be located where material can be washed into a drain, stream or wetland area, including on a road pavement, on an overland flow path or within 15m of a stream bank, wetland or mangrove.
- All rock used in the construction of the defences will be volcanic in origin, come from licensed quarry sites, and will be clean and free from silt and other loose terrestrial material.

- A staged approach will be adapted to remove the existing armour layer, reprofiling the underlying beach, laying the geotextile filter layer and replacing the concrete slab/block and rock armour layer. This will ensure that there is a minimal length of beach exposed at any time reducing the potential for increased suspended sediments at high tide.
- Where stockpiling of sediment material is conducted on land or any land areas are cleared of vegetation, geotextile sediment fencing will be erected around all areas. The fence will be installed prior to stockpiling/clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150mm, and the fence posts installed on the downside of the fabric. The fences will be checked regularly and where sediment has built up, this will be removed.
- As soon as possible after the works are completed, rehabilitation of and exposed areas, such as the road verge will be undertaken.

6.2.1.4 Control and disposal of wastes and hazardous materials

There is the potential for pollution to be released into the marine and terrestrial environments during the construction works from activities using the heavy machinery, or from any washdown or laydown sites established for the works.

These is also the potential for pollution to be created by the improper management of solid waste generated by the works.

Protective Measures:

- All non-hazardous, non-recyclable waste will be placed in containers and regularly emptied and disposed of to a permitted landfill site.
- Lubricants and used oils will be stored in approved containers and promptly removed from site and disposed of as directed by KIRMA
- Care will be taken to prevent any releases or spills of fuel and lubricants during fueling and maintenance of construction equipment and will be prevented from entering the ground, drainage areas or water courses by using appropriate containers and bunds. No such activities will be undertaken within at least 15m of the coast.
- Any oily debris and contaminated soils will be recovered and disposed of as directed by KIRMA
- Adequate sanitary convenience that meets public health and environmental requirements will be provided for construction staff on site.
- On completion of the works, all surplus materials and construction debris shall be removed and recycled or disposed of in an appropriate manner.

6.2.2 Social Impacts

6.2.2.1 Haulage of Construction Materials

Main haulage activities will involve transport of rock armour from the permitted quarry (possibly at Yeseng) to the sites at Paal and Mosral. This will not pass through built up residential areas but will pass a small number of residential properties potentially causing dust and noise nuisance as well as a safety risk to pedestrian vehicle traffic.

Protective Measures:

- Equipment and trucks passing through Malem village and other residential areas will slow to an appropriate speed to avoid noise and vibration disturbance as far as possible.

- Consultations will be undertaken with affected residents prior to commencement of works to advise of potential impacts and management measures.
- Construction vehicles using public and private roads will be clean with loads secured to prevent accidental spillage. Any accidental spillage of material transported on to roads beyond the immediate construction area will be promptly cleaned up.
- Establishment of machinery storage and washdown areas will be kept to a minimum and will be removed and the area reinstated and vegetated after construction. Any washdown areas shall be a minimum of 15m from any natural water course and washdown run off will not be discharged into natural waterways

6.3 Inland Road Relocation in Kosrae: Design phase

This activity carries the greatest environmental and social impact risk from the project. The following potential significant impacts have been identified in relation to activities under this output which provides for the inland realignment of the coastal road between Malem and Utwe on Kosrae.

The EIS for the road realignment contains details related to the potential environmental impact using the KIRMA Regulations for Development Project – Initial Environmental Impact Assessment checklist. Subsequent to this a 2019 Adaptation Fund safeguards assessment audit identified additional potentially significant impacts. Table 6 below is the updated KIRMA impact assessment table based on the 2019 audit findings (Y – yes, N – no, P – potentially). Parameters which are likely to be impacted by this activity are highlighted in the table.

Table 6: Kosrae EIA Regulations Impact Screening Table

Environmental Impacts – will the proposed project result in:		Y	N	P
1. Earth	a. Destruction, covering or modifications of any unique geological or biophysical feature		X	
	b. Contamination of soils or disturbance of previously or potentially contaminated soils?			X
	c. Creation of steep or other unstable land conditions?	X		
	d. Any potential for increased wind or water erosion (including in coastal areas) or soils, either on or off the site?	X		
	e. Changes in the channel of a stream, or the bed of the ocean or lagoon?			X
2. Air	a. Substantial air emissions, including greenhouse gas emissions, or deterioration of existing air quality?		X	
	b. Creation of objectionable odours?		X	
3. Water	a. Changes in currents, or the course or direction of water movement in either the marine or freshwaters?		X	
	b. Changes in absorption rates, drainage patterns, or the amount of surface run off?	X		
	c. Cause or exacerbate coastal, stream or river flooding or land drainage impacts?	X		
	d. Alterations to the course or flow of flood waters?	X		
	e. Discharge into surface waters or any alteration of surface water, water quality, including, but not limited to, temperature, dissolved oxygen, bacteria or turbidity?	X		
	f. Change in the quality or contamination of ground waters or wells, either through direct additional, withdrawal, seepage, or through interception of an aquifer by cuts or excavations?			X
4. Plant life	a. Destruction of any upland or mangrove forest communities?	X		
	b. Destruction of other important plant communities, such as sea grasses, or plants having potential commercial or medicinal value?		X	
	c. Destruction of or a reduction in the numbers of any unique, rare or endangered plant species?	X		
	d. Introduction of a new plant species into the area?		X	

	e. Result in a barrier to the normal replenishment or movement of existing plant species?		X	
	f. Increase in acreage of any agricultural crop?	X		
5. Animal life	a. Destruction or any coral reef areas?		X	
	b. Destruction of or reduction in the number of unique, rare or endangered animal species?		X	
	c. Introduction of new animal species into an area?		X	
	d. Result in a barrier to the migration or movement of animals through the environment?		X	
	e. Substantial deterioration in the quality of fish or wildlife habitat?			X
6. Alien invasive species	a. The potential introduction of alien invasive species			X
	b. The risk of spread or movement of an alien invasive species from an infested site to an un-infested site?	X		
7. Risk of Upset	a. A risk of an explosion or the release of hazardous substances, including, but not limited to oil, pesticides, chemicals or radiation, in the event of an accident or perturbed conditions?	X		
8. Climate change – will the proposed project be affected by:		Y	N	P
	a. Loss of land associated with ongoing, or storm or typhoon-related, shoreline change or coastal erosion?		X	
	b. Coastal flooding from high tides, large swells, storm or typhoon-related events?		X	
	c. Exposure of people or property to water related hazards such as flooding or tidal waves?		X	
	d. Extreme rainfall and associated flooding, including from rivers and streams, or water logging and drainage of low lying lands?	X		
	e. The effects of sea-level rise or other climate change influences of the hazards in (a) to (c)?		X	
Social impacts – will the proposed project result in		Y	N	P
9. Earth	a. Exposure of people and property to geological hazards such as landslides, ground failure or similar hazards?	X		
10. Water	a. Substantial reduction in the amount or quality of water otherwise available for public water supplies?		X	
11. Noise	a. Increase in existing noise levels or exposure of people to severe noise levels?	X		
12. Land use	a. Substantial alteration of the present or planned land use of an area?			X
	b. Incompatibility or conflict with adjacent land use(s)?		X	
13. Population	a. Relocation or altered distribution, density or growth rate of the human population of the area?	X		
14. Housing	a. Changes in existing housing or create a demand for additional housing?	X		
15. Transportation	a. Generation of substantial additional vehicular movement?		X	
	b. Substantial impact on roads and existing transportation system?	X		
	c. Alteration to present patterns or movement of people and/or goods?	X		
16. Human health	a. Creation of any health hazard or potential health hazards?		X	
	b. Improvement in human health?		X	
17. Aesthetics	a. Obstruction of our deterioration of any scenic vista?		X	
18. Recreation	a. Changes in the quality or amount of existing recreational opportunities, including those recommended sites for nature-based tourism?	X		
19. Cultural resources	a. Alteration or destruction of archeological sites?			X
	b. Adverse physical or aesthetic effects to a historic resource?			X
	c. Potential to cause a physical change that would affect unique cultural values?		X	
	d. Restriction of existing religious or sacred uses within the affected area?		X	
Economic impact – will the proposed project result in		Y	N	P
20. Natural resources	a. A noticeable increase in the rate of use of any natural resource?	X		
	b. Substantial depletion of any non-renewable natural resources?			X
21. Public services – will the proposed project affect or result in the need for new or altered services in the following areas?		Y	N	P
	a. Police or fire protection?		X	
	b. Schools?		X	
	c. Parks or other recreational facilities?		X	

	d. Hospital?		X	
	e. Other government services?		X	
22. Utilities – will the proposed project result in the need for new systems or substantial changes in the following?		Y	N	P
	a. Power	X		
	b. Communications?	X		
	c. Water?		X	
	d. Sewage disposal?		X	
	e. Solid waste disposal?		X	

Potential significant environmental and social impacts from this table are discussed below in relation to the impact generating activity and protective measures are also provided.

6.3.1 Environmental Impacts

6.3.1.1 Design of road and drainage

1. The road alignment was identified in 2016 but the detailed design has not yet been completed. The majority of the Malem to Utwe road will run along or close to the 10m contour up to the end of the inland farm road at Kuplu.

The inland road will also cross a number of perennial and intermittent streams that drain the upper catchments into freshwater swamp/mangrove areas and rivers all leading into the marine environment.

Furthermore, increases in sea level and rainfall affects drainage of low-lying swamp and farmland areas behind the coastal berm leading to an increased frequency of waterlogging and flooding of land and potentially increased frequency of drainage and stream outlet blockage at the coast. Increasing the surface area of the inland road through construction of the new sections will increase the amount of rainfall run off into the lower lying areas. If the design of any drainage (including swales, ditches, and cross drains/culverts) does not take into account the downstream impact of the additional rainfall runoff then the flooding impacts will increase.

Drainage also needs to take into account that outfall cannot be onto privately owned land as this would degrade the land and potentially cause flooding.

Protective measures:

- Bridge and culvert design should be based on the most recent extreme rainfall intensity amount available for Kosrae (ADB, 2005) (shown in section 4.3 of the Environmental Impact Statement) using 2025 as the “present day” scenario and the design accommodate rainfall intensities to the 2050 projections.
- Bridges and culverts are designed to accommodate a 25 year return period flow. This is higher than the 10 year return period specified in the design guidance, however a 25 year return period would make allowances for the uncertainties in climate predictions and surprises in rainfall response to climate change.
- The road design standards include specifications for bridge and culvert wing walls to avoid bank erosion immediately upstream/downstream of each structure.
- Where necessary rock mattresses or equivalent should be installed to prevent any erosion of either the upstream or downstream water course. If exit velocities from any of the culverts

or bridges are likely to be significantly increased above normal, energy dissipation measures should also be included to minimise downstream erosion.

- Ensuring no outflow from drainage expels onto private lands.
- Align the road to minimise the long sloping sections, where necessary having shorter steep sections interspersed with flatter sections that follow the topographical contours.
- Having in- or out-sloping road surfaces to encourage greater lateral flow.
- Intercepting longitudinal water movements with dips or cross drains.
- Slowing drainage flows in the swales or drains at the side of the road to prevent erosion of the drainage channel, through for example construction of regular check dams along sloping sections of the road. These are typically made out of graded rock, with other material such as sandbags able to be used as a temporary measure until the rock check dams are installed.

6.3.1.2 Identification of Laydown Sites

Multiple laydown or stockpiling sites will likely be required for these works. Sites will be used to store hazardous substances; stockpile aggregates, excavated soils or other materials; washdown machinery; mix concrete, etc. Environmental degradation can occur if these sites are located close to or within the run-off path of waterways or the marine environment.

Protective Measures:

- All stockpile or laydown sites will be located a minimum of 15m from any natural water course and at least 30m from the coastline.
- Laydown sites will be kept to a minimum and the areas will be reinstated and revegetated on completion of works.
- Laydown and stockpile sites should be on government land where possible. For any sites on private land, the owners should be fully consulted and will sign an agreement for temporary use of the land.

6.3.1.3 Clearing of Native Upland Forest

Between Kuplu and Finsrem approximately 1.15 miles of proposed new road will pass through a section of upland forest both above and below the Japanese line (Figure 14). In order to build the road, the forest will need to be cleared along the alignment and up a maximum width of 60ft.



Figure 16: Special consideration districts. Source: Kosrae State Land Use Plan (Kosrae State, 2003)

The upland forest (Figure 16) is undisturbed and provides a good example of tropical oceanic island rain forest where species diversity is high. In Kuplu Wan the forest is dominated by tall *Horsfieldia* (Nunu), *Fale Sandlewood* (Mwetkwem), *Elaeocarpus carolinensis* (Nahnek), *Banyan tree* (Kohnyah), *Strangler Fig* (Shrah), *Neubergia* (Tohoh) and thickets of *Hibiscus* (Lo) and *Parinari laurina* (Ahset).⁷ Tree ferns, lianas, vines and terrestrial ferns characterize the mid and ground levels. Minimal agroforestry occurs currently within the interior of Kuplu Wan but there has been greater use historically, including during the Japanese period.

Clearing of this tract of forest will remove several large mature tree specimens, some of which (such as the Banyan) are considered to be culturally important as well as biologically significant. The loss of this area of upland forest will be permanent but will be limited in geographic scope to the road easement corridor.

Protective measures:

- Only the road alignment corridor can be cleared of mature tree specimen. Minor coppicing work can be undertaken surrounding the corridor if needed, however no mature tree specimens will be removed outside of this corridor.

⁷ Kosrae State Land Use Plan, Kosrae State, 2003

- Road alignment will be routed to avoid any stands of mature trees which provide important ecosystem services such as soil stabilization.
- No laydown site(s) or stockpile site(s) will be located along the 1.15 mile stretch of new road between Kuplu and Finsrem.

6.3.1.4 Earthworks

1. The most significant impacts related to the construction activities related to potential excessive runoff of soils and silt and soil erosion of cleared or exposed soils from earthworks. The inland road between Malem and Kuplu mostly follows the 10m contour and this was aligned, as far as possible, located on soils with lower erosion potential and to follow the natural topographic contour which helps reduce potential erosion.

The steep sections between Kuplu and Finsrem will be prone to erosion, particularly during rain events which are frequent on Kosrae.

The downstream environments are adapted to a certain amount of natural soil and silt run off. Despite the relatively natural state of the catchments, stream turbidity can increase substantially during periods of intense rain. Measurements in streams leading to the Lelu water supply in Tofol indicated variations in turbidity from < 10 NTU to > 250NTU over short periods of time following rainstorms.⁸ Drinking water is generally less than 5 NTU and highly murky water is > 200NTU. These storm events are generally short in duration with streams reverting to typical flows and low turbidity and do not appear to have significant impact on stream biota or downstream ecosystems. During construction works there is significant potential for increased turbidity from sediment laden run off which could have longer term impacts on the ecosystem health.

2. Earthworks on the slopes of the Kuplu Finsrem plateau as well as earthworks which will create wider sections on road by cutting or filling along any of the road sections have the potential to create steep or unstable land areas which could create landslides. Landslides primarily occur when heavy rains destabilise soil on steep slopes, causing them to crumble.
3. Along the inland road from Malem to Kuplu, there is a notable presence of the creeper vine *Merremia peltate* which is highly invasive and smothers its host plants creating a monoculture which displaces native plant species. From Kuplu to Finsrem, through the new road area the invasive vine isn't present to any significant level (Figure 17). Clearing the forest in this area and undertaking significant earthworks will create the ideal conditions for this vine species to invade the upland forest eventually resulting in a loss of biodiversity along the new section of road. While it is likely that this introduction cannot be avoided, Figure 17 demonstrates that along other sections of the inland road the spread of the vine is relatively contained to the disturbed areas and, as long as the upland forest habitat remains undisturbed outside the road corridor then the geographic scale of the vine will be limited.

⁸ Kosrae Inland Road Realignment Environmental Impact Statement, 2016

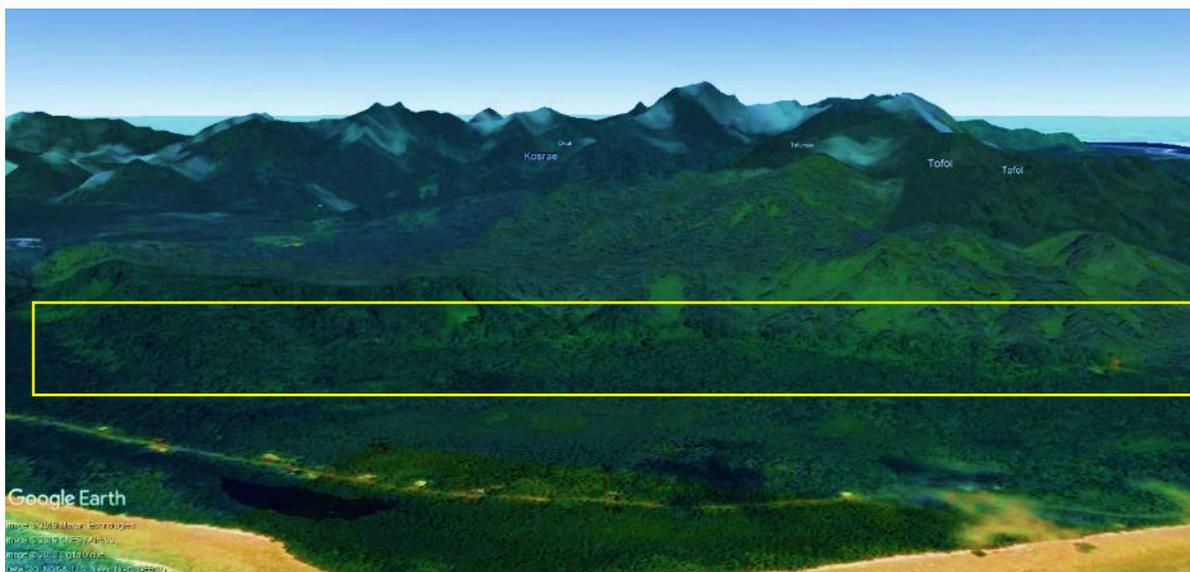


Figure 17: 3D Google Earth view of existing inland road sections between Yeseng and Finsrem (yellow bounding box). Colours edited to show changes in vegetation make up along existing road and upland forest where no road and therefore no altered vegetation exists.

Protective Measures:

- All excavated slopes should be designed and constructed to be resistant to landslides through erosion control techniques, geotextiles, soils and hydrological data.
- Only remove trees and plants which are absolutely necessary between Kuplu and Finsrem.
- Land clearance and excavation should be clearly defined and the footprint minimised to as great an extent as possible.
- Excavated soils will be stockpiled on KIRMA and DTI approved sites and will be controlled to ensure no material can runoff into waterways or the coastal environment.

6.3.2 Social Impacts

6.3.2.1 Alignment through residential property

All easements will be entered into on a voluntary basis and each landowner has the right to refuse donation. There will be instances where the proposed alignment cuts through landowners property and potentially disrupts the use of their residential site and may result in objections from that landowner.

Protective Measures:

- For any disputes over alignment through residential areas, the primary method of settling this would be through avoidance of the disputed area and a small realignment of the road to a more acceptable route.

6.3.2.2 Cultural Heritage

The locations of known historical and culturally important sites are shown in **Error! Reference source not found.** The majority are military installations from the Japanese era with prehistoric sites

at Lele and Kuplu/Mosral. Since these sites were identified during the development of the EIS, a new site which was thought to be one of the original inland settlements has also been identified in the upland forest above Kuplu. This site has been added to the figure below (blue dot) and the road alignment doesn't go through the site, although it passes very close to it.

A survey of the known sites is detailed in the EIS however, it is possible that at any stage of construction works new items of cultural importance or archeological artifacts can be revealed.

Damage to known sites and new sites uncovered during construction is possible when working with heavy construction machinery. Once damaged or lost, these sites cannot be replaced and they must be protected from any damage.

7 Environmental and Social Management Plans

7.1 Introduction

Sections 7.2, 7.3 and 7.4 below contain the required management plans for the physical investments under component 2 and 3 as well as the associated Monitoring Plan for each of the physical investment areas. The management plans include measures to satisfy both National and State regulations as well as the Adaption Fund (and SPREPs) safeguard policies. They describe details of the mitigation measures required, the responsible entity and the applicable project phase.

Monitoring Plans are also provided for each physical investment type. These plans include items which require a one-off check prior to commencement of works and also parameters which need to be monitored weekly to ensure ongoing compliance during construction phase. Where appropriate, there are also recommended monitoring requirements for the operational phase of the works, however these will be the responsibility of the relevant authority to include in their own maintenance arrangements after project completion.

Section 7.6 provides the project team for a guide to site selection for water security investments, particular the sites for well upgrades and installations of SCTs. These tend to be 'rules of thumbs' and will need to applied in the context of each village.

Section 7.7 provides some higher-level guidance to the EE and IE on how to ensure environmental and social safeguards are implemented into the technical advisory activities. This ensures that all contracts, TORs, policies, plans, frameworks, etc developed under this project are screened to ensure that the development process and the recommendations follow the principles of the Adaptation Fund.

7.2 Management Plan for Water Security Measures

7.2.1 Environmental and Social Management Plan

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
1 Design/Pre-Construction Phase – Water Security Measures						
Site Selection for Investments	Access to communal water supply compromise if investment is installed on private land without full landowner cooperation.	<ul style="list-style-type: none"> Avoid installation or upgrades of any community water supply on private land. If private land is needed, easements signed and submitted with any private land owners prior to the commencement of any works. Easement should include provisions to manage or relinquish the land within a 30m circle around the well head to minimise the risk of contamination. No compulsory land acquisition will be used for any investment. 	Yap, Chuuk, Pohnpei	Prior to design of interventions	Project Unit	DECEM
	Water quality comprised from any community ground water sources on private land through poor land use management around well head.	<ul style="list-style-type: none"> Sign easement with landowner to prevent use of land for any contaminate generating activities within 30m radius of well head and to permit access by public health or other relevant officers to conduct water quality testing. Otherwise, Consultations with the landowners to be documented to demonstrate that any landowners have been made aware of the land use restrictions around any community ground water supply on their land. 	Yap, Chuuk, Pohnpei	Prior to design of interventions	Project Unit	DECEM
Design of Self Composting Toilets	SCT design allows too much light into toilet chamber causing to user to see other human waste leading to overuse of bulking agent and/or abandonment of SCT.	<ul style="list-style-type: none"> Ensure the waste pile is some distance below the toilet seat and that little light is getting in so that it is hard to see into the toilet. The design should use a pedestal with a round hole at the lower end rather than a toilet seat placed onto a box. 	Yap, Chuuk, Pohnpei	During design	Designers	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> Treated wood shall be used to minimize risk of termite infestation. The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3). Ensure good ventilation to minimize odours. Access for people with mobility issues and the elderly will be considered in the design process to ensure ease of access. 				
	Lack of readily accessible and easily gathered bulking agent leading to disrupted composting process, foul odours, additional burden on women to gather some types of bulking agent and/or abandonment of composting toilets	<ul style="list-style-type: none"> Consultations with the communities to discuss their preferred bulking agent and also raise awareness of the likely additional workload and importance of using this bulking agent. All consultations to be undertaken in such a way to ensure meaningful input by women. The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3). 	Yap, Chuuk, Pohnpei	During design	Designers	Project Unit
	Urine separation facility can lead to foul smelling odour from soils receiving output waste	<ul style="list-style-type: none"> Banana circles planted close to the toilet to take the urine drain and process the leachate from the toilet is a very effective and sanitary solution The SCT designers should be required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3). 	Yap, Chuuk, Pohnpei	During Design	Designer & Community	Project Unit
Design of water extraction from wells	Contamination of water scoop/bucket from ground around well head for manual extraction	<ul style="list-style-type: none"> Use the Kiribati designed 'Tamana' pump to extract water. This pump required no electrical motor and is built from various sizes and lengths of PVC piping. This design is widely used throughout Kiribati to extract 	Yap, Chuuk, Pohnpei	During Design	Designer	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
	<p>leading to contamination of collected water and ground water.</p> <p>For mechanical extraction, risk of failure of electrical (including solar) pumps</p>	<p>water with a great degree of success. The Tamana Pump's basic components are 25mm PVC pip, usually up to 30m long; a 50mm PVC pipe, 1m long; 1 25mm to 50mm, 45o PVC reducer bend; a 25mm elbow; a 25mm PVC male adaptor; a foot valve; and, a piston made of one-half in PVC piping.</p> <ul style="list-style-type: none"> • No electrical pumps to be installed under this project. • Project will support activities to upgrade structure of the wells walls and cover the well heads to provide safe, easy access to the water via the Tamana pump. 				
Construction Phase – Water Security Intervention						
Solid waste production during construction	Overburden on existing waste management practices	<ul style="list-style-type: none"> • All solid waste will be securely stored at construction laydown site until disposal. • Solid waste which cannot be reused, recycled, composted or otherwise utilised by the community will be removed from the island and disposed of at a permitted landfill on the main island of that state. 	Yap, Chuuk, Pohnpei	Throughout construction	Contractor	Project Unit
Operation of laydown site	Environmental risks to ground water, coastal water and soil from poorly planned and managed construction staging and laydown site	<ul style="list-style-type: none"> • Laydown areas will be sited on public or 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 and the preparation of concrete. • 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 	Yap, Chuuk, Pohnpei	Throughout construction	Contractor	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<p>be at a rate to allow absorption without causing surface flooding</p> <ul style="list-style-type: none"> • Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Water conservation measures will be implemented and workers trained on this. • Regular inspection of machinery to ensure it is in good working order. 				
Concrete production for foundation pads or well heads	Ground water pollution	<ul style="list-style-type: none"> • 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. • 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 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. 	Yap, Chuuk, Pohnpei	Throughout construction	Contractor	Project Unit
Construction within village	Community health and safety risks from construction activities	<ul style="list-style-type: none"> • Community consultations carried out as per this ESMP. • Post signs on the laydown sites advising community member to keep out. • Install secure fencing around laydown sites. 	Yap, Chuuk, Pohnpei	Prior to commencement of works and throughout works	Contractor	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> Construction work will only be carried out during normal business hours. Assign personnel to manage traffic movement and safety as required. 				
Operation Phase – Water Security Interventions						
Use and Maintenance of Self Composting Toilets	Unfair additional burden on women for SCT maintenance	<ul style="list-style-type: none"> Detailed training on the need for and correct method of SCT maintenance should be given to both men and women. Separate consultations should be held with women to get their input and opinion on the likely success of the SCT maintenance given that this will likely fall to them. Equal gender representation is important during trainings to ensure that men feel responsibility towards this task and do not see it as a ‘women’s job’. An understanding of local traditions and customs is needed for this as discussion of sanitary matters is often ‘tapu’ and can be difficult to get input. A local language speaker should lead these trainings and discussions rather than any international representatives. Identification of the party responsible for maintenance and monitoring of the SCT should be identified before construction commences. 	Yap, Chuuk, Pohnpei	Ongoing	Village Councils	DECEM

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
	Poor maintenance of SCTs will lead to pathogens remaining active in the compost mix.	<ul style="list-style-type: none"> • Training materials to be developed in local language to cover the key areas of maintenance – lack of available bulking agent, lid not being kept closed, chamber not being emptied according to designers schedule. • Detailed training on the need for and correct method of SCT maintenance should be given to both men and women. • Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance of SCTs. 	Yap, Chuuk, Pohnpei	Prior to hand over of SCT	Project Unit	DECEM
	Contaminated run-off, rodent infiltration or public access risks to poorly managed secondary containment units	<ul style="list-style-type: none"> • Maintenance and monitoring of the secondary processing container needs to be undertaken to ensure that it is meeting all necessary standards for correct processing. 	Yap, Chuuk, Pohnpei	Ongoing	Village Councils	DECEM
	Possible crop contamination from improper use of mature compost	<ul style="list-style-type: none"> • Provide training on when and where to use the compost. Training should include: no use on food crops around harvesting time to provide additional time for any remaining pathogens to die off, after compost has been spread cover it with mulch to avoid the possibility of the compost drying to dust and being carried by the wind, it is best to dig the compost into the ground, do not use on ground being prepared for vegetable crops, do not apply directly on vegetable crops, if compost is fully matured and older than 3 years then all pathogens will be dead and the compost will be safe to use for any kind of agriculture. 	Yap, Chuuk, Pohnpei	Prior to hand over of SCT	Project Unit	DECEM
Maintenance of water harvesting systems	Contamination of harvested water from dirty guttering and/or mosquito infiltration of storage tank	<ul style="list-style-type: none"> • Training materials to be developed in local language to cover the key areas of maintenance – period clearing or gutters, maintenance of any mosquito screens, basic water quality testing, etc. 	Yap, Chuuk, Pohnpei	Prior to hand over of SCT	Project Unit	DECEM

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> • Detailed training on the need for and correct method of maintenance and water quality testing should be given to both men and women. • Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance. 				

7.2.2 Monitoring Plan for Water Security Interventions

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
1 Design/Pre-Construction Phase – Water Security Measures					
Site Selection for Investments	<ul style="list-style-type: none"> Avoid installation or upgrades of any community water supply on private land. If private land is needed, easements signed and submitted with any private land owners prior to the commencement of any works. Easement should include provisions to manage or relinquish the land within a 30m circle around the well head to minimise the risk of contamination. No compulsory land acquisition will be used for any investment. 	One off: Signed voluntary donation easement sighted for any installations on private land. Easement to include 30m diameter from well head and provisions for land use management.	Prior to finalization of site selection	DECEM	SPREP
Design of Self Composting Toilets	<ul style="list-style-type: none"> Ensure the waste pile is some distance below the toilet seat and that little light is getting in so that it is hard to see into the toilet. The design should use a pedestal with a round hole at the lower end rather than a toilet seat placed onto a box. The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3). 	One off: Design of SCT to ensure it meets these standards	Prior to approval of design	DECEM	SPREP
	<ul style="list-style-type: none"> Consultations with the communities to discuss their preferred bulking agent and also raise awareness of the likely additional workload and importance of using this bulking agent. All consultations to be undertaken in such a way to ensure meaningful input by women. The SCT designers are required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites (Annex 3). 	One off: Evidence that bulking agent has been selected based on community consultation	Prior to approval of design	DECEM	SPREP
	<ul style="list-style-type: none"> Banana circles planted close to the toilet to take the urine drain and process the leachate from the toilet is a very effective and sanitary solution The SCT designers should be required to use the SPC document 'Composting toilets and the potential for use in the Pacific Islands' as a guide for considerate design of SCTs at the project sites. 	One off: design incorporates banana circle and evidence that this has been consulted with the community	Prior to approval of design	DECEM	SPREP

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Design of water extraction from wells	<ul style="list-style-type: none"> Use the Kiribati designed 'Tamana' pump to extract water. This pump required no electrical motor and is built from various sizes and lengths of PVC piping. This design is widely used throughout Kiribati to extract water with a great degree of success. The Tamana Pump's basic components are 25mm PVC pip, usually up to 30m long; a 50mm PVC pipe, 1m long; 1 25mm to 50mm, 45o PVC reducer bend; a 25mm elbow; a 25mm PVC male adaptor; a foot valve; and, a piston made of one-half in PVC piping 	One off: design incorporates Tamana pump for all upgraded well heads	Prior to approval of final design	DECEM	SPREP
Construction Phase – Water Security Measures					
Solid waste production during construction	<ul style="list-style-type: none"> All solid waste will be securely stored at construction laydown site until disposal. Solid waste which cannot be reused, recycled, composted or otherwise utilised by the community will be removed from the island and disposed of at a permitted landfill on the main island of that state. 	Weekly: Waste collection at laydown area is secure, well signed and clean. Good housekeeping around project sites. Waste is being removed to a KIRMA approved disposal site.	For duration of works	Project Unit	DECEM
Operation of laydown site	<ul style="list-style-type: none"> Laydown areas will be sited on public or 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 and the preparation of concrete. Run off from these bunded areas will be collected, treated and tested before being either reused for construction purposes or allowed to discharge into 	One off: All mitigation measures are in place	Prior to commencement of works	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	the ground, away from the marine environment. Discharge will be at a rate to allow absorption without causing surface flooding <ul style="list-style-type: none"> • Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Water conservation measures will be implemented and workers trained on this. • Regular inspection of machinery to ensure it is in good working order. 	Weekly: all mitigation measures are in place and functional as per ESMP.	For duration of works.	Project Unit	DECEM
Concrete production for foundation pads or well heads	<ul style="list-style-type: none"> • 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. • 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 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 mitigation provisions are in place	Prior to commencement of concrete production	Project Unit	DECEM
		Weekly: concrete production is occurring at designated area, water catchment and treatment systems are functional	During concrete production works	Project Unit	DECEM
Construction within village	<ul style="list-style-type: none"> • Community consultations carried out as per this ESMP. • Post signs on the laydown sites advising community member to keep out. • Install secure fencing around laydown sites. • Construction work will only be carried out during normal business hours. 	One off: fences are in place, signs are in place and community has been consulted.	Prior to commencement of works	Project Unit	DECEM
		Weekly: mitigation measures are being implemented as required in ESMP	Duration of works	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> • Ensure equal opportunities to apply to work on the construction of the SCTs is given to women. • Assign personnel to manage traffic movement and safety as required. 				
Operational Phase					
Use and Maintenance of Self Composting Toilets	<ul style="list-style-type: none"> • Detailed training on the need for and correct method of SCT maintenance should be given to both men and women. Separate consultations should be held with women to get their input and opinion on the likely success of the SCT maintenance given that this will likely fall to them. Equal gender representation is important during trainings to ensure that men feel responsibility towards this task and do not see it as a 'women's job'. An understanding of local traditions and customs is needed for this as discussion of sanitary matters is often 'tapu' and can be difficult to get input. A local language speaker should lead these trainings and discussions rather than any international representatives. 	One off: evidence that training and consultation has occurred as required.	Prior to hand over of SCT	DECEM	SPREP
	<ul style="list-style-type: none"> • Training materials to be developed in local language to cover the key areas of maintenance – lack of available bulking agent, lid not being kept closed, chamber not being emptied according to designers schedule. • Detailed training on the need for and correct method of SCT maintenance should be given to both men and women. • Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance of SCTs. 	One off: training materials produced, training undertaken and posters in place	Prior to hand over of SCP	DECEM	SPREP
	<ul style="list-style-type: none"> • Maintenance and monitoring of the secondary processing container needs to be undertaken to ensure that it is meeting all necessary standards for correct processing. 	Monthly: secondary containment is leak free and well maintained	For life of SCT	Village Council	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> Provide training on when and where to use the compost. Training should include: no use on food crops around harvesting time to provide additional time for any remaining pathogens to die off, after compost has been spread cover it with mulch to avoid the possibility of the compost drying to dust and being carried by the wind, it is best to dig the compost into the ground, do not use on ground being prepared for vegetable crops, do not apply directly on vegetable crops, if compost is fully matured and older than 3 years then all pathogens will be dead and the compost will be safe to use for any kind of agriculture. 	One off: Training provided and attended by all relevant stakeholders	Prior to hand over of SCT	DECEM	SPREP
Maintenance of water harvesting systems	<ul style="list-style-type: none"> Training materials to be developed in local language to cover the key areas of maintenance – period clearing or gutters, maintenance of any mosquito screens, etc. Detailed training on the need for and correct method of maintenance should be given to both men and women. Information posters should be installed in communities to ensure ongoing reminders of correct use and maintenance. 	Periodic: all elements of water harvesting system are cleaned and functional	Ongoing	Village Council	DECEM

7.3 Management Plan for Kosrae Coastal Defence Upgrades

7.3.1 Environmental and Social Management Plan

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
Pre-Construction Phase – Kosrae Coastal Defence Upgrades						
General Impacts						
Safeguard Integration	No safeguard requirements being adhered to or considered during the design process	<ul style="list-style-type: none"> The ESMP shall be included in the TORs or works agreements. 	Paal and Mosral	Prior to finalization of design	Project Unit	DECEM
	No safeguard requirements being captured within the works agreement with the PIU	<ul style="list-style-type: none"> Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8. 	Paal and Mosral	Prior to finalization of design	Project Unit	DECEM
	No safeguard requirements being contractually applicable to the Contractor during project implementation	<ul style="list-style-type: none"> The ESMP will be included in the contractors specification and contract. Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions. 	Paal and Mosral	During development of contract	Project Unit	SPREP
	National safeguard legislation not adhered to during project implementation	<ul style="list-style-type: none"> Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application. 	Paal and Mosral	Prior to commencement of works	Project Unit	KIRMA
Environmental Impacts						
Design of Revetment Works	Downdrift erosion on adjacent shorelines at Paal and Mosral	<ul style="list-style-type: none"> Design of revetment shall include input from DTI engineers to ensure best practices design of the transition between the defence and the beach to the south. The revetment at Paal will extend behind the existing shoreline at this point to ensure that outflanking and downdrift erosion does not occur. The revetment at Mosral at the southern end will be constructed at a shallower slope and armour rock used to construct a wider and 	Paal and Mosral	During design	DTI	Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		flatter toe on the reef flat. This will ease the transition from defence to the beach and help prevent downdrift and outflanking effects.				
	Impaired functioning of revetment works from damaged coastal outlet at Mosral leading to increased risk of flooding behind or undermining of revetment.	<ul style="list-style-type: none"> Design of the revetments will include design of repairing the outflow at Mosral to ensure effective linkage between the two pieces of infrastructure. 	Mosral	During design	DTI	Project Unit
Social Impacts						
Design of Revetment	Lack of community support for the design	<ul style="list-style-type: none"> Ensure all key community stakeholders are included in the consultations for the final revetment design to ensure local knowledge is captured in the solution. 	Paal and Mosral	During design	DTI	Project Unit
Construction Phase – Kosrae Defence Upgrades						
Environmental Impacts						
Construction of Revetments	Increased risk of sedimentation and erosion of shoreline from movement of heavy machinery	<ul style="list-style-type: none"> The construction footprint on the reef flat will be minimise to no more than 10m in width from the toe of the beach/revetment and will not extend beyond the southern or northern extent of the proposed defence section. Access to the reef flat by construction plant will be over the beach within the area of proposed defence reconstruction. At Paal additional care will be taken to ensure no heavy plant encroaches to or impacts on the root system of the mangrove strand that is located further seaward on the reef flat at 	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		the southern end of the proposed defence extent.				
	Risk of fuel or oil spills into marine environment from construction machinery	<ul style="list-style-type: none"> Spill kits will be available on site during construction works and all staff members will be trained in their use. No refueling activities or storage of hazardous substances are permitted at the coastal construction site. 	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit
Exposure of soils during reconstruction	Removing the existing armour and regrading underlying beach will result in additional suspended sediment	<ul style="list-style-type: none"> No burning of ground cover for clearing shall be practiced. No vegetation should be removed from the shoreline berm beyond the southern extent of the proposed defences at Paal and Mosral. Stockpiles of beach sand, coral rubble or rock armour will not be located where material can be washed into a drain, stream or wetland area, including on a road pavement, on an overland flow path or within 15m of a stream bank, wetland or mangrove. All rock used in the construction of the defences will be volcanic in origin, come from licensed quarry sites, and will be clean and free from silt and other loose terrestrial material. A staged approach will be adapted to remove the existing armour layer, reprofiling the underlying beach, laying the geotextile filter layer and replacing the concrete slab/block and rock armour layer. This will ensure that there is a minimal length of beach exposed at any time 	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<p>reducing the potential for increased suspended sediments at high tide.</p> <ul style="list-style-type: none"> Where stockpiling of sediment material is conducted on land or any land areas are cleared of vegetation, geotextile sediment fencing will be erected around all areas. The fence will be installed prior to stockpiling/clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150mm, and the fence posts installed on the downside of the fabric. The fences will be checked regularly and where sediment has built up, this will be removed. As soon as possible after the works are completed, rehabilitation of and exposed areas, such as the road verge will be undertaken. 				
Solid Waste Generation	Potential for pollution to be created by the improper management of solid waste	<ul style="list-style-type: none"> All non-hazardous, non-recyclable waste will be placed in containers and regularly emptied and disposed of to a permitted landfill site. On completion of the works, all surplus materials and construction debris shall be removed and recycled or disposed of in an appropriate manner. 	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit
Control and disposal of hazardous materials	Pollution of marine and terrestrial environment	<ul style="list-style-type: none"> Lubricants and used oils will be stored in approved containers and promptly removed from site and disposed of as directed by KIRMA Care will be taken to prevent any releases or spills of fuel and lubricants during fueling and maintenance of construction 				

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<p>equipment and will be prevented from entering the ground, drainage areas or water courses by using appropriate containers and bunds. No such activities will be undertaken within at least 15m of the coast.</p> <ul style="list-style-type: none"> • Any oily debris and contaminated soils will be recovered and disposed of as directed by KIRMA • Adequate sanitary convenience that meets public health and environmental requirements will be provided for construction staff on site. 				
Operation of laydown site	Environmental risks to ground water, coastal water and soil from poorly planned and managed construction staging and laydown site	<ul style="list-style-type: none"> • Laydown areas will be sited on public or 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 and the preparation of concrete. • 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 • Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. • Water conservation measures will be implemented and workers trained on this. 	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<ul style="list-style-type: none"> Regular inspection of machinery to ensure it is in good working order. 				
Social Impacts						
Haulage of Construction Materials	Noise and dust nuisance from haulage works	<ul style="list-style-type: none"> Consultations will be undertaken with affected residents prior to commencement of works to advise of potential impacts and management measures. Construction vehicles using public and private roads will be clean with loads secured to prevent accidental spillage. Any accidental spillage of material transported on to roads beyond the immediate construction area will be promptly cleaned up. Establishment of machinery storage and washdown areas will be kept to a minimum and will be removed and the area reinstated and vegetated after construction. Any washdown areas shall be a minimum of 15m from any natural water course and washdown run off will not be discharged into natural waterways 	All haulage routes	Throughout construction	Contractor	DTI & Project Unit
	Increased risk to other vehicle and pedestrian traffic	<ul style="list-style-type: none"> Equipment and trucks passing through Malem village and other residential areas will slow to an appropriate speed to avoid noise and vibration disturbance as far as possible. Spotters will be used at key junctions and through villages to ensure haulage trucks are keeping to the speed limit Signage will be installed to advise drivers of the speed limit through residential areas. 	Malem to Utwe	Throughout construction	Contractor	DTI & Project Unit

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
Construction near residential areas	Community health and safety risks from construction activities	<ul style="list-style-type: none"> • Community consultations carried out as per this ESMP. • Post signs on the laydown sites advising community member to keep out. • Install secure fencing around laydown sites. • Construction work will only be carried out during normal business hours. • Assign personnel to manage traffic movement and safety as required. 	Paal and Mosral	Throughout construction	Contractor	DTI & Project Unit

7.3.2 Monitoring Plan for Kosrae Coastal Defence Upgrades

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Pre-Construction Phase – Kosrae Coastal Defence Upgrades					
General Impacts					
Safeguard Integration	<ul style="list-style-type: none"> The ESMP shall be included in the TORs or works agreements. 	One-off: Prior to release of any contract documents	Before tender	DECEM	SPREP
	<ul style="list-style-type: none"> Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8. 	One-off: Prior to release of any contract documents	Before tender	DECEM	SPREP
	<ul style="list-style-type: none"> The ESMP will be included in the contractors specification and contract. Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions. 	One-off: Prior to release of any contract documents	Before tender	DECEM	SPREP
	<ul style="list-style-type: none"> Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application. 	One off: prior to commencement of works	During design process	DECEM	SPREP
Environmental Impacts					
Design of Revetment Works	<ul style="list-style-type: none"> Design of revetment shall include input from DTI engineers to ensure best practices design of the transition between the defence and the beach to the south. The revetment at Paal will extend behind the existing shoreline at this point to ensure that outflanking and downdrift erosion does not occur. The revetment at Mosral at the southern end will be constructed at a shallower slope and armour rock used to construct a wider and flatter toe on the reef flat. This will ease the transition from defence to the beach and help prevent downdrift and outflanking effects. 	One-off: Design requirements of ESMP are incorporated into design	Prior to final approval of design	Project Unit	SPREP

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> Design of the revetments will include design of repairing the outflow at Mosral to ensure effective linkage between the two pieces of infrastructure. 	One-off: Final designs include repair/upgrade of Mosral outflow	Prior to approval of final design	Project Unit	SPREP
Social Impacts					
Design of Revetment	<ul style="list-style-type: none"> Ensure all key community stakeholders are included in the consultations for the final revetment design to ensure local knowledge is captured in the solution. 	One off: report of consultations sighted	Prior to approval of final design	Project Unit	SPREP
Construction Phase – Kosrae Defence Upgrades					
Environmental Impacts					
Construction of Revetments	<ul style="list-style-type: none"> The construction footprint on the reef flat will be minimise to no more than 10m in width from the toe of the beach/revetment and will not extend beyond the southern or northern extent of the proposed defence section. Access to the reef flat by construction plant will be over the beach within the area of proposed defence reconstruction. At Paal additional care will be taken to ensure no heavy plant encroaches to or impacts on the root system of the mangrove strand that is located further seaward on the reef flat at the southern end of the proposed defence extent. 	Weekly: no evidence of machinery working outside of the 10m boundary. No evidence of other beach access being used by machines other than over existing work site. Mangrove root system remains undamaged at Paal	Duration of works	Project unit	DECEM
	<ul style="list-style-type: none"> Spill kits will be available on site during construction works and all staff members will be trained in their use. No refueling activities or storage of hazardous substances are permitted at the coastal construction site. 	Weekly: spill kit available on site. All refueling happening at designated sites away from coast.	Duration of works	Project unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Exposure of soils during reconstruction	<ul style="list-style-type: none"> • No burning of ground cover for clearing shall be practiced. • No vegetation should be removed from the shoreline berm beyond the southern extent of the proposed defences at Paal and Mosral. • Stockpiles of beach sand, coral rubble or rock armour will not be located where material can be washed into a drain, stream or wetland area, including on a road pavement, on an overland flow path or within 15m of a stream bank, wetland or mangrove. • All rock used in the construction of the defences will be volcanic in origin, come from licensed quarry sites, and will be clean and free from silt and other loose terrestrial material. • A staged approach will be adapted to remove the existing armour layer, reprofiling the underlying 	<p>One off: Contractors plan includes staged approach</p> <p>Stockpile sites adhere to ESMP requirements.</p> <p>Revegetation has occurred on completion</p>	Prior to commencement of works	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<p>beach, laying the geotextile filter layer and replacing the concrete slab/block and rock armour layer. This will ensure that there is a minimal length of beach exposed at any time reducing the potential for increased suspended sediments at high tide.</p> <ul style="list-style-type: none"> Where stockpiling of sediment material is conducted on land or any land areas are cleared of vegetation, geotextile sediment fencing will be erected around all areas. The fence will be installed prior to stockpiling/clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150mm, and the fence posts installed on the downside of the fabric. The fences will be checked regularly and where sediment has built up, this will be removed. As soon as possible after the works are completed, rehabilitation of and exposed areas, such as the road verge will be undertaken. 	<p>Weekly: no evidence of burning</p> <p>No vegetation cleared in excess of project footprint</p> <p>Stockpiles are correctly located and well managed.</p> <p>Aggregates or rocks are clean</p>	<p>For duration of works</p>	<p>Project Unit</p>	<p>DECEM</p>
<p>Solid Waste Generation</p>	<ul style="list-style-type: none"> All non-hazardous, non-recyclable waste will be placed in containers and regularly emptied and disposed of to a permitted landfill site. On completion of the works, all surplus materials and construction debris shall be removed and recycled or disposed of in an appropriate manner. 	<p>Weekly: Waste collection at laydown area is secure, well signed and clean.</p> <p>Good housekeeping around project sites.</p> <p>Waste is being removed to a KIRMA approved disposal site.</p>	<p>For duration of works</p>	<p>Project Unit</p>	<p>DECEM</p>
<p>Control and disposal of hazardous materials</p>	<ul style="list-style-type: none"> Lubricants and used oils will be stored in approved containers and promptly removed from site and disposed of as directed by KIRMA Care will be taken to prevent any releases or spills of fuel and lubricants during fueling and maintenance of construction equipment and will be prevented from entering the ground, drainage areas 	<p>One off: all mitigation provisions are in place</p>	<p>Prior to commencement of concrete production</p>	<p>Project Unit</p>	<p>DECEM</p>

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<p>or water courses by using appropriate containers and bunds. No such activities will be undertaken within at least 15m of the coast.</p> <ul style="list-style-type: none"> Any oily debris and contaminated soils will be recovered and disposed of as directed by KIRMA Adequate sanitary convenience that meets public health and environmental requirements will be provided for construction staff on site. 	<p>Weekly: oils and lubricants stored correctly</p> <p>Good housekeeping at site</p> <p>Waste is being disposed of as per KIRMA instructions</p>	<p>During concrete production works</p>	<p>Project Unit</p>	<p>DECEM</p>
<p>Operation of laydown site</p>	<ul style="list-style-type: none"> Laydown areas will be sited on public or 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 and the preparation of concrete. 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 Segregated storage for solid waste will be provided. This area will be clearly marked and designed to ensure that as waste is secure. Water conservation measures will be implemented and workers trained on this. Regular inspection of machinery to ensure it is in good working order. 	<p>One off: All mitigation measures are in place</p>	<p>Prior to commencement of works</p>	<p>Project Unit</p>	<p>DECEM</p>
		<p>Weekly: all mitigation measures are in place and functional as per ESMP.</p>	<p>For duration of works.</p>	<p>Project Unit</p>	<p>DECEM</p>
<p>Social Impacts</p>					

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Haulage of Construction Materials	<ul style="list-style-type: none"> • Consultations will be undertaken with affected residents prior to commencement of works to advise of potential impacts and management measures. • Construction vehicles using public and private roads will be clean with loads secured to prevent accidental spillage. Any accidental spillage of material transported on to roads beyond the immediate construction area will be promptly cleaned up. • Establishment of machinery storage and washdown areas will be kept to a minimum and will be removed and the area reinstated and vegetated after construction. Any washdown areas shall be a minimum of 15m from any natural water course and washdown run off will not be discharged into natural waterways 	One off: consultations have taken place and plans are responsive to these comments Washdown area is correctly established	Prior to commencement of haulage	Project Unit	DECCEM
		Weekly: Roads are clear of spilled materials Good housekeeping at washdown sites	Duration of works	Project Unit	DECCEM
		Weekly: Spotters are in place during haulage Any complaints from communities are addressed and resolved. Signage in place	Duration of haulage	Project Unit	DECCEM
Construction near residential areas	<ul style="list-style-type: none"> • Community consultations carried out as per this ESMP. • Post signs on the laydown sites advising community member to keep out. • Install secure fencing around laydown sites. • Construction work will only be carried out during normal business hours. • Assign personnel to manage traffic movement and safety as required. 	One off: fences are in place, signs are in place and community has been consulted.	Prior to commencement of works	Project Unit	DECCEM
		Weekly: mitigation measures are being implemented as required in ESMP	Duration of works	Project Unit	DECCEM

7.4 Management Plan for Kosrae Inland Road Realignment

7.4.1 Environmental and Social Management Plan

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
Pre-Construction Phase – Kosrae Inland Road Realignment						
General Impacts						
Safeguard Integration	No safeguard requirements being adhered to or considered during the design process	<ul style="list-style-type: none"> The ESMP shall be included in the TORs or works agreements. 	Kosrae	During development of tender documents	Project Unit	SPREP
	No safeguard requirements being captured within the works agreement with the PIU	<ul style="list-style-type: none"> Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8. 	Kosrae	During development of tender documents	Project Unit	SPREP
	No safeguard requirements being contractually applicable to the Contractor during project implementation	<ul style="list-style-type: none"> The ESMP will be included in the contractors specification and contract. Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions. 	Kosrae	During development of tender documents	Project Unit	SPREP
	National safeguard legislation not adhered to during project implementation	<ul style="list-style-type: none"> Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application. 	Kosrae	Prior to commencement of works		
Environmental Impacts						
Design of road and drainage	Disruption of perennial and intermittent streams that drain the upper catchments into the marine environment	<ul style="list-style-type: none"> Bridge and culvert design should be based on the most recent extreme rainfall intensity amount available for Kosrae (ADB, 2005) (shown in section 4.3 of the Environmental Impact Statement) using 2025 as the “present day” scenario and the design accommodate rainfall intensities to the 2050 projections. Bridges and culverts are designed to accommodate a 25 year return period flow. 	Malem to Utwe	During road design	Design Engineer	DTI
	Increased run off from increased road surface area exacerbating down stream flooding behind coastal berm.					

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		<p>This is higher than the 10 year return period specified in the design guidance, however a 25 year return period would make allowances for the uncertainties in climate predictions and surprises in rainfall response to climate change.</p> <ul style="list-style-type: none"> • The road design standards include specifications for bridge and culvert wing walls to avoid bank erosion immediately upstream/downstream of each structure. • Where necessary rock mattresses or equivalent should be installed to prevent any erosion of either the upstream or downstream water course. If exit velocities from any of the culverts or bridges are likely to be significantly increased above normal, energy dissipation measures should also be included to minimise downstream erosion. • Align the road to minimise the long sloping sections, where necessary having shorter steep sections interspersed with flatter sections that follow the topographical contours. • Having in- or out-sloping road surfaces to encourage greater lateral flow. • Intercepting longitudinal water movements with dips or cross drains. • Slowing drainage flows in the swales or drains at the side of the road to prevent erosion of the drainage channel, through for example construction of regular check dams along sloping sections of the road. These are typically made out of graded rock, with other material such as sandbags able to be used as 				

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
		a temporary measure until the rock check dams are installed.				
	Erosion and flooding of privately owned land from drainage outflow	<ul style="list-style-type: none"> Ensuring no outflow from drainage expels onto private lands. 	Malem to Utwe	During design phase	Design Engineer	DTI
Identification of Laydown Sites	Environmental degradation and contamination of water resources if sites located close to or within the run-off path of waterways or the marine environment	<ul style="list-style-type: none"> All stockpile or laydown sites will be located a minimum of 15m from any natural water course and at least 30m from the coastline. Laydown sites will be kept to a minimum and the areas will be reinstated and revegetated on completion of works. Laydown and stockpile sites should be on government land where possible. For any sites on private land, the owners should be fully consulted and will sign an agreement for temporary use of the land. 	All laydown sites	During design phase	DTI	KIRMA
Sourcing of Aggregates	For any locally sourced aggregates potential adverse impacts include air emissions, noise and vibration, waste, land conversion and dust.	<ul style="list-style-type: none"> Local aggregates will only be sourced from quarries with existing permits from KIRMA and who are operating in compliance with the conditions of those permits. 	Quarries	Prior to commencement of works	DTI	KIRMA
	If imported consignments are not properly treated and/or washed before shipping, there is the risk of introducing non-native and potentially invasive plants, animals and disease.	<ul style="list-style-type: none"> Any internationally imported equipment and materials will have to comply with FSM biosecurity and quarantine regulations. 	Kosrae	Prior to commencement of works	DTI	KIRMA
Social Impacts						

Activity	Significant Potential Impacts	Mitigation Measures	Location	Timing/ Duration	Who Implements	Who Supervises
Alignment through residential properties	Disruption to land owners access to and use of village property	<ul style="list-style-type: none"> For any disputes over alignment through residential areas, the primary method of settling this would be through avoidance of the disputed area and a small realignment of the road to a more acceptable route. 	Malem to Utwe	During design phase	Design Engineers	Project Unit
Community Engagement	Misconceptions regarding the project raising peoples fears regarding project footprint and objectives	<ul style="list-style-type: none"> Implement the Stakeholder Engagement and Consultation Plan (Section 5 of this ESMP) 	Malem to Utwe	During design phase	Project Unit	KIRMA and DECEM

7.4.2 Monitoring Plan for Kosrae Inland Road Realignment

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
Pre-Construction Phase – Kosrae Inland Road Realignment					
General Impacts					
Safeguard Integration	<ul style="list-style-type: none"> The ESMP shall be included in the TORs or works agreements. 	One off: ESMP in TOR	Prior to release of any procurement document	DECEM	SPREP
	<ul style="list-style-type: none"> Include key mitigation measures from ESMP within the works agreement, particularly the detailed roles as described in Section 8. 	One off: required elements included in contract	Prior to release of any procurement document	DECEM	SPREP
	<ul style="list-style-type: none"> The ESMP will be included in the contractors specification and contract. Specific mitigation measures for the contractor / supplier shall be highlighted in the general conditions. 	One off: required elements included in contract	Prior to release of any procurement document	DECEM	SPREP
	<ul style="list-style-type: none"> Obtain Development Consent from KIRMA based on the Kosrae EIA Regulations and using this ESMP to inform the application. 	One off: Development Consent approved	Prior to commencement of works	DECEM	SPREP
Environmental Impacts					
Design of road and drainage	<ul style="list-style-type: none"> Bridge and culvert design should be based on the most recent extreme rainfall intensity amount available for Kosrae (ADB, 2005) (shown in section 4.3 of the Environmental Impact Statement) using 2025 as the “present day” scenario and the design accommodate rainfall intensities to the 2050 projections. Bridges and culverts are designed to accommodate a 25 year return period flow. This is higher than the 10 year return period specified in the design guidance, 	One off: All stipulated safeguard design requirements are included in detailed design	Prior to approval of detailed design	Project Unit	DECEM

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<p>however a 25 year return period would make allowances for the uncertainties in climate predictions and surprises in rainfall response to climate change.</p> <ul style="list-style-type: none"> • The road design standards include specifications for bridge and culvert wing walls to avoid bank erosion immediately upstream/downstream of each structure. • Where necessary rock mattresses or equivalent should be installed to prevent any erosion of either the upstream or downstream water course. If exit velocities from any of the culverts or bridges are likely to be significantly increased above normal, energy dissipation measures should also be included to minimise downstream erosion. • Align the road to minimise the long sloping sections, where necessary having shorter steep sections interspersed with flatter sections that follow the topographical contours. • Having in- or out-sloping road surfaces to encourage greater lateral flow. • Intercepting longitudinal water movements with dips or cross drains. • Slowing drainage flows in the swales or drains at the side of the road to prevent erosion of the drainage channel, through for example construction of regular check dams along sloping sections of the road. These are typically made out of graded rock, with other material such as sandbags able to be used as a temporary measure until the rock check dams are installed. 				

Activity	Mitigation Measures	Monitoring / Frequency	When	Who will monitor	Supervision
	<ul style="list-style-type: none"> Ensuring no outflow from drainage expels onto private lands. 	One off: No outflows designed to enter private lands	Prior to approval of final detailed design	Project Unit	DECEM

7.5 Erosion and Sedimentation Control Plan

Annex 2 contains the Erosion and Sedimentation Control Plan (ESCP) which is required for the coastal defence activities on Kosrae. The requirements of the plan are integrated into the relevant management plan tables above. The ESCP is developed based on the Kosrae Development Regulations and KIRMA development consent which require that at a minimum:

- Disturbance shall be limited during excavation, preserving as much of the vegetated area as possible.
- Where possible, divert upslope storm water around all lands that do not have a protective vegetative cover.
- Install sediment fences down slope of all disturbed lands to filter coarse sediment before it gets into the gutters, drains and watercourses.
- Place all stockpiles totally on the site, well away from drainage paths and, where they comprise erodible materials such as sand and soil, behind a sediment barrier.
- Soil and cement bags are covered at the end of the day.
- All earthmoving activities shall be planned in such a manner as to minimise the area of disturbed land, mangrove, reef or lagoon.
- All permanent facilities for the conveyance of water around, through or from the project site shall be designed to reduce the velocity of flow in the facility to speed that will not cause significant erosion.
- Within a section or area of the project, all slopes, channels, ditches or any disturbed area shall be stabilised as soon as possible after the final grade or final earth moving has been completed.
- Where it is not possible to permanently stabilise a disturbed area immediately after the final earthmoving has been completed or where the activity stops for more than 14 days, interim stabilisation measures shall be promptly implemented.
- Before filling or development activities occur within a body of water or tidal zone, adequate seawalls and/or breakwater facility shall be constructed to safely contain the fill without failure and to prevent accelerated sedimentation.
- Run off from a project area shall not be discharged into the waters of Kosrae state without effective means to prevent sedimentation.
- Solid separation facilities shall be installed which at a minimum:
 - i. A basin for settling solids out of the water shall be structurally sound and have sufficient capacity to hold the water that drains into the basin until the solids have settled out.
 - ii. The basin shall be cleaned when the settling of solid has reduced the capacity of the basin by 25 percent.
 - iii. Outlet structure shall be designed to allow only adequate settled water to be discharged, and at a rate that will not cause accelerated erosion

7.6 Site Selection for Water Security Interventions

Some guiding principles for the site selection for these activities are:

- Apply an age-gender-diversity perspective and use community-based approaches in ground truthing and site selection activities.

- SCTs should be sited so that all toilets can be used safely by all members of the local community, including children, older people and pregnant women.
- Sites should be selected to ensure fair and equitable access for all members of the community especially women.
- Ensure that all SCTs have hand washing facilities.
- Women must be consulted on the design and location of water security interventions.
- Ensure that the location of the SCT facilitate eliminates threats to the security of users, especially women and girls, day and night.

Another important thing to consider is contamination risk. Table 7 below provides some similar ‘rules of thumb’ for minimising the risk of water contamination.

Table 7: Minimum distances from sources of pollution⁹

Feature	Minimum distance from water source
Community-level solid waste dump	100m
Storage (or dumps) of petroleum, fertilisers or pesticides	100m
Places where animals are slaughtered	50m
Cemetery	50m
Toilets / latrines (open pit)	30m
Household waste dump	30m
Animal pens	30m
Laundry place	20m
Large trees with extensive root system	20m
Dwellings	10m

7.7 Technical Assistance and Policy Development

7.7.1 Policy, Regulations and Plan Development

Any development of policies or programs will follow the citizen engagement, gender and safeguard policies ensuring that all affected parties are engaged in the process of development and that broader impacts on gender, environment, etc. are considered.

7.7.1.1 Gender Mainstreaming

The design of the project requires equal and active participation, however, there is a risk that gender may not be mainstreamed into the Framework for National Water and Sanitation Policy in FSM, the National Water and Sanitation Policy, National Water Outlook Program and the Water Sectoral Investment Plan.

In order to ensure these activities fully incorporates the AF Gender Policy, a gender specialist should be hired to undertake a gender-sensitive review of the policy frameworks and plans. The specialist

⁹ Environmental assessment and risk screening for rural water supply. Consortium for Sustainable Water, Sanitation & Hygiene in Fragile Contexts, 2015.

should refer to experiences and tools from previous CCA projects, e.g. PACC, GCCA, IWRM, Pacific Gender & Climate Change Toolkit as well as the Adaptation Fund's Gender Policy and Action Plan and the associated guidelines for this plan. The findings from the review will be used to inform and strengthen the final outputs of these activities.

7.7.2 Consultants

Consultants may be required for the ground truthing assessments and the development of the teacher's guide. TORs for any consultants will require the consultant to comply with the ESMP and the AF safeguards and gender policies.

For all technical assistance consultants this ESMP will be included in the TOR and final contract.

7.7.3 Capacity Building and Materials Development

Awareness materials will be developed and awareness raising activities will be undertaken under the project aimed at the general public for raising awareness on climate change. Gender balance shall be considered during the activities to ensure that women are equally represented.

7.7.4 Municipality Development Plans

The plans developed under output 4.1 will serve as the overall strategic plans of the communities. These will be climate and disaster resilient plans that link all sector plans that exist currently for the islands integrating approaches with the view to reduce the vulnerability and promote risk reduction measures to island water and municipality coastal resources.

A safeguards assessment will be required for each of the development plans to ensure that any potential environmental or social impacts of the are properly understood and measures are incorporated to avoid, minimise or mitigate for these impacts.

8 ESMP Implementation

8.1 Integration of ESMP into Project Management

This ESMP will be included in all bid document packages.

The safeguards requirements of this ESMP will be referenced in appropriate parts of the technical specification, Contractors contract and any TORs for supervision or issued under the project. The IE will be required to review all bid documents prior to approval.

Prior to commencement of works, the Kosrae road Contractor will be required to attend a half day pre-construction safeguards workshop with the IE Safeguards Specialist to ensure that all parties understand their obligations under the terms of the Contract.

8.2 Roles and Responsibilities

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

8.2.1 Project Board

The Project Board is formed of representatives from the IE (SPREP) and the EE (DECEN, KIRMA, R&D Yap, EPA Chuuk, EPA Pohnpei) as well as high level community representatives in the project areas. The board is chaired by the Director General of SPREP. The Board is directly involved in the GRM, to resolve grievances that will be referred to it by the National Project Manager

8.2.2 Implementing Entity

SPREP is the accredited IE for this project and provides a Country Programme Officer and high level project management support to the Executing Entity. As the accredited IE, SPREP is fully responsible (legally and financially) for the implementation of this project including the safeguards standards required by the Adaptation Fund. The IE:

- Acts as a focal point for communications with AF on project related matters;
- Ensures compliance with AF funding requirements, including safeguard compliance;
- Provide inputs into project scope and design;
- Provide additional technical capacity to PMU where required
- Updating the ESMP as necessary to reflect changes in the designs;

8.2.3 Project Management Unit under DECEN

A Project Management Unit (PMU) is has been established within DECEN and it includes a National Project Coordinator, Knowledge and Communications Officer, Project Accountant and a Project Officer on Kosrae. The PMU 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. Where additional technical capacity is required by the PMU, the IE will procure this resource.

The PMU will have the responsibility to oversee the implementation of the ESMP and their responsibilities include, but are not limited to:

- Acts on behalf of the Project Board and works closely with all contracted parties to ensure that project objectives are delivered in a compliant manner consistent with State and AF safeguard requirements;

- Monitor and evaluate project activities and outputs and report the findings to the Project Board by periodic progress reports. These reports will include all aspects of safeguards compliance of the project including the results of scheduled monitoring, and instances of non-compliance, any environmental incidents and any GRM submissions/responses.
- On Kosrae, conducting quarterly safeguard audits with the Supervision Engineer and other staff;
- Weekly monitoring of the physical investments on Kosrae as per the requirements of the ESMP Supervision Plan for compliance with the ESMP;
- Monitors and manages all complaints/incidents reported to the Project GRM;
- Manages the review process of Contractors management plan up to formal approval;
- Updating the ESMP as necessary to reflect project change;
- Applying for all approvals and permits;
- Facilitate meaningful consultations with stakeholders and communities to enable them to provide meaningful input and direction into the Project;
- Publicly discloses any project information and reports including this ESMP;
- Provide support and recommendations to the Supervision Engineer for any instances of Contractor non-compliance;
- Receive and review monthly reports from Supervision Engineer and share reports with Project Director.
- PMU with the support of Project Board is responsible for managing recurring instances of non-compliance by the Contractor as they are referred by the Supervision Engineer.
- Responsible for managing all instances of non-compliance by the Supervision Engineer

The PMU National Project Coordinator 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 PMU during busy periods such as consultations or construction monitoring.

8.2.4 Design Engineer

It is the Design Engineers responsibility to:

- Comply with this ESMP in the development of the detailed design, procurement bid documents and other advice to the PMU;
- Avoid or minimise environmental and social impacts by design;
- Undertake meaningful consultation with stakeholders to inform the design process.

8.2.5 Contractors

This section is applicable to any party undertaking physical building works under any project activity. It is the Contractors responsibility to:

- Ensure the Contractors project team includes experienced HSE experts with sufficient in-country time allocation and financial resources specified in the Contract;
- Prepare and have cleared by the Supervision Engineer the any environmental management plans required in this ESMP prior to commencement of works;
- Carry out the project activities in accordance with the ESMP;
- Not to undertake any works or changes to works unless first approved in an updated CESMP;

- Conduct daily and weekly safeguard inspections of the works to ensure compliance and reporting the results of these inspections to the Supervision Engineer;
- Undertake community consultations as required in this ESMP in coordination with the PMU;
- Advise the Supervision Engineer of any changes to works or methods that are outside the scope of the ESMP for updating;
- Post all notifications specified in this ESMP at the site entrance;
- Report all environmental and OHS incidents to the Supervision Engineer for any action;
- Provide monthly reports of all safeguard monitoring, incidents, complaints and actions to the Supervision Engineer;
- Maintain a database of all complaints, incidents or grievances received. Any issues which cannot be dealt with immediately should be reported to the Supervision Engineer.

8.2.6 Supervision Entity

The Supervision Entities are responsible for the day to day oversight of the construction or other works for the project, including safeguard compliance. On Kosrae, the Supervision Engineer will be DTI and will work closely with the Contractor on a daily basis to ensure that the project is implemented in a compliant manner consistent with the detailed designs provided and the ESMP. They are responsible for:

- Daily monitoring the Contractors work for compliance with the ESMP as per the measures detailed in Sections 7.2, 7.3 and 7.4 providing safeguard monitoring results in their monthly reporting to PMU. As part of their ESMP monitoring responsibilities, the Supervision Engineer will ensure that a suitably experienced engineer or /HSE officer is resourced to provide regular site inspections and is available for support at other times to respond to incidents, non-compliances and other tasks.
- Working with Contractor and PMU to provide meaningful input and direction into community consultations;
- Managing instances of non-compliance by the Contractor and reporting all instances to PMU. They are also responsible for escalating recurring instances of non-compliance by the Contractor to PMU for action;
- Managing and responding to all direct complaints/incidents received by their representatives as per the GRM process in Section 5.6 and reporting all instances to PMU for inclusion into Project database.

8.2.7 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 PMU to ensure adequate citizen and stakeholder engagement in their work programme.

8.3 ESMP Budget

For the Kosrae road construction, the costs of implementing the ESMP for the Contractor will be included in the tender documents and shown as a line item in the BOQ. It is the contracting parties responsibility to ensure that they have provided adequate financial resources to undertake all responsibilities as prescribed in this ESMP.

The following is an approximate budget for implementing the ESMP by the PMU, based on the tables in Section 7 and the responsibilities detailed in Section 8.

Budget Item	Detail	Timeframe	Cost Estimate (USD)
Nanumaga Harbour and Funafuti Port			
Stakeholder consultations	All four States: Catering, venue hire, media, materials, travel and accommodation, translation and interpretation services, etc.	Prior to commencement of works and then ongoing as needed	25,000
ESMP Training for Project Teams	Travel and accommodation to Pohnpei, catering, venue hire	On finalization of ESMP prior to commencement of works	15,000
Disclosure of safeguards instruments	Translation, report production, distribution	Prior to start of works	4,000
GRM related costs	Personnel, communication, transportation, office support costs	All of project implementation	5,000
Monitoring and Reporting	Non-staff costs: logistics and report production	All of project implementation	5,000
	Estimated Total Budget		50,000

9 Capacity Development & Training

9.1 Capacity Development

The EE has no inhouse safeguards specialists, therefore the IE will provide technical safeguards advice when required.

9.2 Training

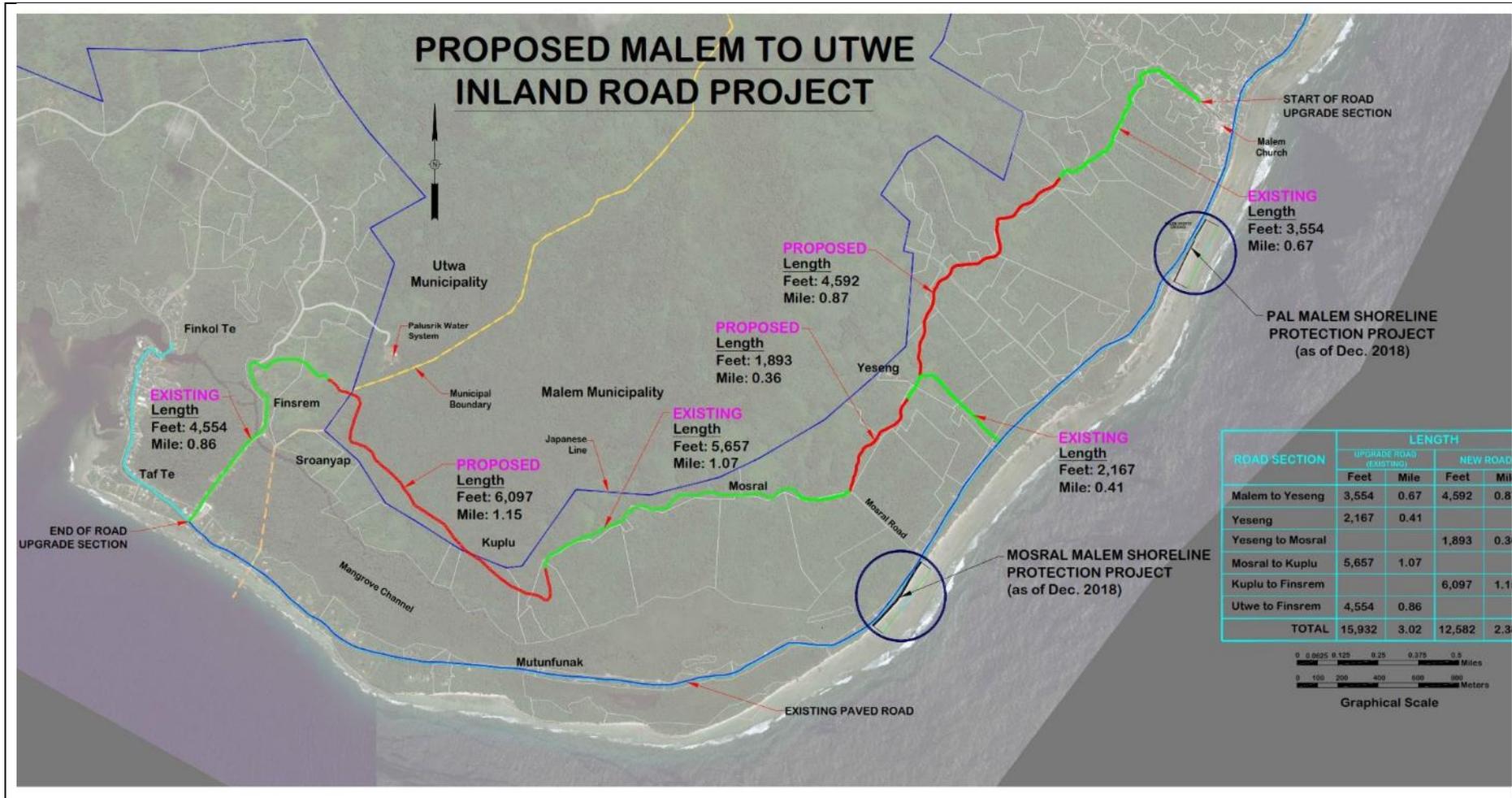
The PMU and project teams will require training to ensure effective implementation and oversight of the ESMP.

Areas recommended for PMU training include the following –

- Adaptation Fund safeguard 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.

On-going support will be provided by the IE for the duration of the project.

Annex 1: Kosrae Inland Road Detailed Alignment



Annex 2: Sediment and Erosion Control Plan

Aspect	Measures	Timeline	Indicators	Responsibility
Governance and Monitoring	Setting up of reporting plan to oversee, inspect and monitor erosion and sediment control measures, including rehabilitation of exposed areas and revegetation of buffer areas	Monthly	Records of weekly monitoring Records of non-compliance and actions taken Monthly report submitted	Project Unit
	Establishment of a GRM to address public and/or community issues and concerns	Ongoing	Number of grievances received and actions taken	DTI
Implementation and Construction	Minimise land disturbance by clearing the smallest practical width to accommodate the new inland road ahead of construction, as well as ensuring the land is disturbed for the shortest possible time	Construction phase	Sediment run off minimised from project site	Contractor, DTI
	Stage clearing activities, where possible, so that only the areas which are being actively developed are exposed	Construction phase	Sediment run off minimised from project site	Contractor, DTI
	No burning of ground cover during vegetation clearing	Construction phase	Sediment run off minimised from project site	Contractor, DTI

Aspect	Measures	Timeline	Indicators	Responsibility
	Stockpiles of aggregates/materials will not be located where they can be washed into a drain, stream or wetland area, including on a road pavement, on a drainage or on overland flow path or within 15m of a stream bank, wetland or mangrove	Construction phase	Proper storage of construction materials	Contractor, DTI
	Stockpiles or any erodible materials (e.g. gravel, sand, soil) will be placed behind a sediment barrier. Gravel/sand/soil and cement bags will be covered appropriately at the end of each construction day	Construction phase	Proper storage of construction materials	Contractor, DTI
	Geotextile sediment fencing will be erected around all areas where vegetation has been cleared and soil exposed. The fence should be installed prior to clearing, as close to the contour of the site as possible, with the bottom edge of the fence buried to at least 150 mm, and the fence posts installed on the downside of the fabric. The fences will be	Construction phase	Fence erected and soil protected	Contractor, DTI

Aspect	Measures	Timeline	Indicators	Responsibility
	checked regularly and where sediment has built up, this will be removed.			
	Install temporary drains or bunds around cleared areas to divert stormwater upslope where necessary, and to prevent discharge of stormwater. Any structures for water conveyance will be designed to reduce the velocity of flow so as not to cause significant erosion	Construction phase	Proper channelling of stormwater, sediment control and prevention of sedimentation of waterways	Contractor, DTI
	Install sediment traps to slow run-off containing sediment and a basin to allow settlement of coarse sediment.	Construction phase	Sediment control and prevention of sedimentation of waters	Contractor, DTI
	Install erosion control matting or mulch on any exposed batter slopes prior to revegetation, if required	Construction phase	Soil erosion control and prevention of sedimentation of waters	Contractor, DTI
	Upon completion of works, removal of stormwater and sediment control structures/equipment	Post construction phase	Area clean, to contribute to successful rehabilitation	Contractor, DTI
	Rehabilitation, grading and stabilisation of exposed and disturbed soil areas on the shoulder and adjacent areas. Excavated topsoil will be	Post construction phase	Area successfully rehabilitated	Contractor, DTI

Aspect	Measures	Timeline	Indicators	Responsibility
	stockpiled and re-used and revegetation completed of bare areas.			
	Revegetating buffer areas around streams and other catchment drainage pathways (planting of native species around streams and potential food trees along the edge of road shoulder)	Post construction phase	Buffer area revegetated	KCSO, Malem and Utwe communities, KIRMA

Annex 3: SPC Composting Toilets Guide

[Link To: SPC Self Composting Toilets in the Pacific Islands Guide](#)