

Environment Management Plan (EMP)

Coastal Protection to be implemented at Ha'atafu and Kolovai – Hihifo District, Tongatapu, TONGA

1. The Environment Management Plan (EMP)

The purpose of creating this Environmental Management Plan (EMP) is to assist and to guide contractors and monitoring agencies the application of mitigation measures on the environmental issues identified in connection with this Coastal Protection project.

The EMP deals with mitigation and management measures during implementation to avoid, reduce, and mitigate adverse environmental impacts.

It is very critical to note here that SPC must ensure to include the EMP in the tender documents for civil works. It will form part of the contract between SPC/MEIDECC and the selected contractors and the requirements of the EMP will be contractually binding on the contractors.

2. Contractors Environmental Management Plan (CEMP).

After appointment and mobilization, the contractor must prepare his own version of the EMP to be known as the Contractors EMP (CEMP). This must give specific details of locations of each infrastructure and facilities within the project site. This must be submitted by the contractor to SPC and MEIDECC for their approval before works commence.

3. Environmental Management and Monitoring Plan (EMMP).

The Environmental Monitoring Program is included in the Environmental Management Plan and so the EMP can be considered as an EMMP - Environmental Management and Monitoring Plan.

4. Environmental Monitoring

The essence of monitoring is to ensure Compliance with the EMP. The contractors have a duty to comply with this and the relevant legislation. The supervising contractor/consultant must check their activities and report to MEIDECC. In the event of noncompliance MEIDECC can exert pressure on the contractor to comply.

5. Inspections

It will be necessary to carry out regular inspections to ensure the CEMP is being followed. In fact, simple compliance with the CEMP is not necessarily the final objective. There is no harm in the contractor "going beyond compliance" and running an operation better than that required by the contract.

Initially, contractors should check daily that all operations are being conducted correctly.

- In general "good housekeeping" must be employed and checked by visual inspection.
- Dust must be controlled by covering of stockpiles and water sprays.
- Solid waste, engine oil and grease, must be taken away by waste removal contractors and records kept.
- Construction supervision inspectors must make regular checks and formal reports on site operations.
- They must also investigate any pollution incidents or complaints.

- They must use checklists for record purposes and make sure that the complaint or incident is brought to the notice of the contractor immediately, verbally and with a follow up written notice.

In addition, MEIDECC should make monthly visits to site to check the veracity of reporting.

- They should also review the reports submitted by the consultants to the MEIDECC and report to the PMU project manager.
- The site inspectors should make regular reports which are compiled into a monthly report. This should be submitted to the Supervising Engineer and discussed with the contractors as necessary but at a minimum monthly.
- Monthly reports should be compiled into quarterly reports and a one final report to be submitted to MEIDECC.

6. CEMP Review

Successful implementation of the CEMP will require combined efforts from contractors/consultants, and MEIDECC. The CEMP is a dynamic document and may be subject to change by the contractor as the work progresses. Periodic reviews of the CEMP may be necessary, and these should be encouraged.

7. Response to Complaints

For the duration of the Project constructions:

- Residents and any Affected Persons (Aps) are encouraged to voice complaints and these are to be duly investigated and reported through the contractor to Site Inspection Officer and so to MEIDECC.
- The contractor will be required to display on a notice board a 24-hour phone number to which any complaints can be made.
- All complaints must be responded to in an efficient and polite manner.
- Response to complaints must be checked by the inspectors.
- Any urgent issues must be drawn to the contractors' attention immediately.
- Failure by the contractor to respond in a timely or adequate manner must be raised with them at the monthly progress meetings

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Table I:**Draft Environment Management Plan (EMP) for the Coastal Protection Measures – Ha’atafu & Kolovai, Hihifo District, Tonga***. Source AGS Consultants Dec 2020*

	Activities	Impacts	Mitigation Measures	Implementing Agency	Supervision/ Monitoring Agency
A	Impacts During Pre-Construction Phase				
1	Land ownership	<ul style="list-style-type: none"> Site registered by another person 	<ul style="list-style-type: none"> Survey of Project Land to check for any registered ownership of project land 	MLNR	MEIDECC
2	Road Access	<ul style="list-style-type: none"> Traffic Congestion 	<ul style="list-style-type: none"> Review Transportation Route Plan & apply second options Plan to transport Heavy loads at night – less traffic congestions Prepare Transport Route Plan for transportation of rock/limestone from a Selected Quarry. Best timing and to avoid traffic/noise near schools at daytime Prepare road improvement for access roads from main road and within project site 	Contractor	MEIDECC
3	Sign Board	<ul style="list-style-type: none"> Lack of Public Perception and awareness 	<ul style="list-style-type: none"> Prepare Sign Board with logo of responsible Donor, Implementing Agency, etc., (large sign) and set up at appropriate position near the entrance to the camp site, to be noticed by Public. 	Contractor	MEIDECC
4	Prepare CEMP	<ul style="list-style-type: none"> Cannot start Construction Phase without approval of CEMP 	<ul style="list-style-type: none"> Required submitting CEMP by Construction Contractors within 30 days of signing contract 	Contractor	MEIDECC

5	Access of fishermen	<ul style="list-style-type: none"> No access of community to sea No access for hauling small fishing boats to sea 	<ul style="list-style-type: none"> If /When advised by SPC/MEIDECC to construct a boat ramp/slipway, a variation to the contract will be negotiated. 	Engineers/SPC	MEIDECC
B Impacts During Construction Phase					
1	Human/Social				
1a	Construction Camp/security of site	<ul style="list-style-type: none"> Lack of public perception and awareness Weak Camp Security 	<ul style="list-style-type: none"> See also A3 Display on noticeboard 24 hr phone contact number in case of complaints by any affected persons Security should be maintained on site during working hours to avoid social problems with community Fence in with proper fence - Construction camp and project site Better/friendly relationship between community and workers, – more appropriate to hire local workers from (i) Kolovai/Ahau & Ha'atafu/Kanokupolu villages 	Contractor	MEIDECC
1b	Safety of workers	<ul style="list-style-type: none"> Social Problems within/with Communities 	<ul style="list-style-type: none"> Security should be maintained on site to avoid social problems with community Camp rules to be established and compliance with EMP Entry to site is limited to local workers Must respect Curfew time imposed by Government during COVID-19 restrictions Consumptions of alcohol and illegal drugs are not permitted at project site No gambling at project site 	Contractor	MEIDECC

			<ul style="list-style-type: none"> • Weapons, guns and bladed weapons are not allowed at project site • Local workers are allowed to be hired when required 		
1c	Health Security	<ul style="list-style-type: none"> • Living in unhygienic and unsanitary conditions 	<ul style="list-style-type: none"> • Provide adequate sleeping quarters • Provide clean cooking facilities • Provide sufficient clean drinking water. If possible, install Rainwater Tanks • Provide garbage bins for workers. Waste in the bins should be cleared periodically. • Garbage/Solid wastes must be transported to “Tapuhia” Land Fill once a week. Register with Waste Authority. • Special attention should be paid to the sanitary condition of camps to avoid disease. 	Contractor	MEIDECC
1d	Safety from accidents	<ul style="list-style-type: none"> • Risk of accident from equipment and others 	<ul style="list-style-type: none"> • Safety Precautions must be provided to workers • Introductory briefing on health and safety. • Warning and/or Precaution Signs on safety. • Provide full PPE; safety helmets, safety boots, high vis jackets etc for every worker on site 	Contractor	MEIDECC
2	Construction Activities				
2a	Site Clearance	<ul style="list-style-type: none"> • Ecosystems disturbance • Loss of habitat and species • Soil Erosion on exposed surface • Dust dispersions 	<ul style="list-style-type: none"> • Create Landscaping strategies to revive disturbance/loss of ecosystems, replanting of all trees and plants with cultural and social values, commercial values, medicinal plants, fruit and food trees that will preserve coastal environment • Implement an Erosion Management Plan • Replanting of grasses and vegetations to combat soil erosion • Regularly sprinkling/watering to avoid dispersion of dust to surrounding farms and paddocks 	Contractor	MEIDECC
2b	Earthworks	<ul style="list-style-type: none"> • Dust dispersion • Sediments from stockpiles 	<ul style="list-style-type: none"> • Regular sprinkling • Cover stockpiles tarpaulins or similar materials to stop sediments from eroding and dust from dispersion 	Contractor	MEIDECC

2c	Spoil Disposal	<ul style="list-style-type: none"> • Sediments dispersions • Fire hazard • Odour 	<ul style="list-style-type: none"> • Regular sprinkling of spoils from sediment dispersions • Regular watering to stop accidental fire from spreading surrounding areas • To locate as far as possible from work/living area 	Contractor	MEIDECC
3	Air /Water Quality				
3a	Dust	<ul style="list-style-type: none"> • Road dust 	<ul style="list-style-type: none"> • Access to/at project site will be cleaned and sprinkled at regular intervals to reduce dust disturbance • Loose materials transporting into the site should be covered – preventing spillage 	Contractor	MEIDECC
3b	Vehicles/Heavy construction equipment/machineries	<ul style="list-style-type: none"> • Air Pollution • Road dust dispersion • Noxious fumes • Noise pollution • Hazardous vehicle exhaust emissions • Open, windy - project site favours dispersion of polluted gas and dust 	<ul style="list-style-type: none"> • Roads be regularly cleaned and sprinkled • Strengthen management on internal transport and enforce regular maintenance of transporting vehicles and heavy machineries to effectively reduce exhaust emissions, noxious fumes and noise pollution • Restrictions using of heavy machineries during rainy & wet periods • Employ qualified heavy machinery drivers • Strictly follow workplace access roads only & use lighter machines • Site vehicles and construction equipment should be maintained in good working conditions • Strictly NO works allowed on Sundays • Must require prior permission if working after 24 hours • Very strict on vehicles which emit hazardous exhaust fumes. Must apply relevant standards/must comply with standards 	Contractor	MEIDECC
3c	Water quality/Supply/ Demand	<ul style="list-style-type: none"> • Shortage of drinking water • Poor drinking water quality 	<ul style="list-style-type: none"> • Install rainwater tanks • If possible, use freshwater treatment chemicals • Reduce dust dispersions near water tanks by regular sprinklings • Connection to neighbouring villages underground water reticulation 	Contractor	MEIDECC

		<ul style="list-style-type: none"> • Shortage of water for cleaning purposes 	<ul style="list-style-type: none"> • Must comply with strict rules of using community water, especially in dry spells 		
3d	Sewage	<ul style="list-style-type: none"> • Odour • Water quality of aquifer affected by septic tanks. 	<ul style="list-style-type: none"> • No open septic tanks allowed • Regular inspection of Septic tank • Two septic tank system with sand filters. • To avoid seepage to water lens or down to coastal areas, install monitoring well 	Contractor	MEIDECC/MLNR
3e	Solid Waste Disposal	<ul style="list-style-type: none"> • Domestic refuse littering • Construction waste littering • Waste oil spillage 	<ul style="list-style-type: none"> • Register to collect rubbish regularly (weekly) by Waste Authority Ltd • All construction waste to be removed from site and sent to landfill • No dumping of waste in neighbouring land at coastal area • Waste oils will be re-cycled and will be safely disposed of. 	Contractor	MEIDECC
3f	Drainage	<ul style="list-style-type: none"> • Poor drainage & sediment leaching to coastal areas • Heavy rain may cause runoff of silt/sediments 	<ul style="list-style-type: none"> • Install temporary perimeter drains to carry away rain • Install silt traps in drains • Drains should lead to silt traps • Retention ponds to be created downhill near the eastern boundaries of the site 	Contractor	MEIDECC
4	Biological				
4a	Site Clearance	<ul style="list-style-type: none"> • Loss of tree species • Reduce the limited forests trees at and around the site • Driving bird species further away to other habitats 	<ul style="list-style-type: none"> • Systematic replanting strategy • Landscaping strategies – replanting of all trees and plants with cultural and social values, commercial values, medicinal plants, fruit and food trees that adapt to harsh coastal environment. • Create landscape plan to introduce more trees/plants – eventually bringing birds back to site 	Contractor	MEIDECC
4b	Mangroves	<ul style="list-style-type: none"> • Decrease in mangrove population 	<ul style="list-style-type: none"> • Strictly employ experts to do research on causes of mangrove loss at red zone before planning for any replanting scheme 	Contractor/ Consultant	MEIDECC

			<ul style="list-style-type: none"> • Livestock owners particularly of roaming pigs must put them into enclosures on higher grounds further away from human settlements • Strict monitoring and enforce legislations 		
4c	Bush Fires/Soil erosion/saltwater spraying	<ul style="list-style-type: none"> • Ecosystems disturbances • Threaten to land animals • Salt spraying from the coastal areas – hazard to crops and fruit trees 	<ul style="list-style-type: none"> • Regular watering of Stockpiles – avoid getting on fire and spreading to nearby bushes • Re-plant grazing vegetations disturbed after site • Encourage communities for planting of wind breaks timber and fruit trees along project boundaries to combat salt spraying, soil erosion and wind 	Contractor	MEIDECC
4d	Use of Agricultural chemicals Accidental Chemical/Oil Spills	<ul style="list-style-type: none"> • Decreasing agro-biodiversity • Seepage of chemicals to ocean & freshwater resources • Ecosystems disturbances • Threaten to land animals 	<ul style="list-style-type: none"> • Create buffer/zoning map for restriction of chemical uses at areas close to Site. • Never use Agricultural chemicals such as weed killer during site clearance. • All stored fuel, oils and paints to be stored undercover on hard bases with kerbs to stop spills being washed away in heavy rain 	Contractor	MEIDECC
C	Impacts During Operation Phase				
1	Transportation system & supporting infrastructure	<ul style="list-style-type: none"> • Congestion access route • Limitation Parking Lots • Technical issues 	<ul style="list-style-type: none"> • One-way access route is more suitable • Create large parking lots to accommodate as much vehicle as possible • Regular hands-on & on-site training of local workers 	MOI/Contract or	MEIDECC
2	Biological	<ul style="list-style-type: none"> • Habitat disruptions • Birds/Flying foxes disturbances 	<ul style="list-style-type: none"> • Monitor Landscaping strategies – replanting of all trees and plants with cultural and social values, commercial values, medicinal plants, fruit and food trees. 	MOI/Contract or	MEIDECC

			<ul style="list-style-type: none"> • Relatively low, might occur just at the beginning of the Project operation. Pose no serious threat to species population 		
3	Sewage	<ul style="list-style-type: none"> • Septic tanks problems • Odour 	<ul style="list-style-type: none"> • No open septic tanks allowed on site • Regular inspection of Septic tank • Two septic tank system with sand filters. • Monitoring well 	MOI/Contract or	MEIDECC