

McCONNELL DOWELL CONSTRUCTORS LTD.

CLIENT: GOVERNMENT OF REPUBLIC OF KIRIBATI

PROJECT: KIRIBATI ROAD REHABILITATION PROJECT

LOCATION: TARAWA, KIRIBATI

PROJECT NO.: 2536

# **CONTRACTOR'S ENVIRONMENTAL MANAGEMENT PLAN (CEMP)**

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### Revision History

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## ACRONYMS

CEMP – Contractors Environmental Management Plan (This Plan)

HSE – Health, Safety & Environmental

CEP – Construction Execution Procedure (Method Statement)

JSEA – Job Safety & Environmental Hazard Analysis (Hazard identification)

PEP – Project Execution Plan (Project Management Plan)

EMP – Environmental Management Plan

MMS – McConnell Dowell Management System (MacDow standard procedures & forms database)

TBT – Toolbox Talk (All-in weekly meeting attended by entire workforce covering Health, Safety & Environmental)

MacDow – McConnell Dowell Constructors Ltd

# 1.0 INTRODUCTION

## 1.1 PLAN OBJECTIVES

This Contractor's Environmental Management Plan or CEMP (originally referred to by Client as the Contractor's Environmental Plan) covers strategies, systems and procedures to ensure the Kiribati Road Rehabilitation Project (hereafter known as the Project) meets the environmental obligations and targets for the construction of the new main road, principal feeder and access roads. This CEMP forms an integral part of McConnell Dowell's Management System (MMS).

The purpose of this CEMP is to:

- Achieve the Project's stated environmental objectives and targets;
- Ensure legal and contractual compliance; and
- Outline procedures for the management of environmental protection issues.

The CEMP provides the framework for identifying and managing environmental aspects and impacts associated with the Project.

## 1.2 PROJECT DESCRIPTION

The works are situated on Tarawa, and include the rehabilitation of 24.7 km of the main road between the capital Betio and the international airport at Bonriki, and the rehabilitation of 14 km of minor feeder roads. In addition to the road rehabilitation works, there are repairs and improvements to the Betio Causeway Bridge, upgrading of 11 km of watermain from Teoraereke to Betio, and coastal protection works.

## 1.3 PROJECT SCOPE

The Scope of the Project is to:

- Upgrade South Tarawa road consisting of 6-7m wide sealed road with 1.5m sealed shoulders which will act as footpaths and improved siting for drainage and service lines (electricity, water supply, telephone line and other services).
- Upgrade the road from the Toll Booth on the Betio Causeway to Tanaea including Buota and Temaiku roads (about 27.5 km) but will exclude the section linking Bonriki Airport to the Tarawa Bailey Bridge (includes a short single lane carriageway).
- Break up the surface of existing pavement – laying, mixing, spreading and compacting up to 30 cm of new imported crushed gravel base, and a new bitumen surface. The road will have concrete edging to prevent propagation of edge breakdown of the new road.
- Include the construction of speed humps at suitable locations, and construction of 166 bus stops at locations agreed through council / community consultation.
- Install physical drainage measures to capture stormwater flows. Discharges will be to the lagoon, ocean or land as per contract drawings.
- Rehabilitate the existing sealed roads to a similar level and slightly raise currently unsurfaced roads.

- Ensure surface drainage of the road and drains either side of the road using improved camber.
- Coastal Protection Works
- Modifications to Betio Causeway Bridge

#### 1.4 PROJECT DURATION

Work is expected to commence in October 2013 with an estimated completion date of March 2016.

#### 1.5 PROJECT LOCATION

The Project works are located on Tarawa, Kiribati:

**Figure 1 Aerial Photo of Tarawa**



Tarawa is an atoll in the central Pacific Ocean. It is the location of the capital of the Republic of Kiribati. Tarawa consists of around 24 larger islets, of which at least eight are inhabited. The island is best known by the Battle of Tarawa during World War II. The largest town, Bikenibeu, and the only airport on Tarawa, Bonriki International Airport, are on South Tarawa.



**Figure 2 Location Map**



## 2.0 ENVIRONMENTAL LEGISLATION

This CEMP has been prepared to ensure compliance with Kiribati's relevant environmental legislation and aims to employ best practice environmental management procedures for the Project. The key environmental legislation for the management of the Project is detailed in PEP Att2-1B Review Record ENV Legal (MMS # 025-J002-2536) located in Attachment A of this document.

The Compliance with Legal and Other Requirements (MMS # 000-D004-000) procedure which is part of the Project Execution Plan outlines how McConnell Dowell identifies, maintains and evaluates compliance with legal and other related requirements that are applicable to delivery of the Project.

### 2.1 IMPORTANT LEGISLATION

#### 2.1.1 Environment Act 1999

The Environment Act 1999 provides for the protection, improvement and conservation of the Environment of the Republic of Kiribati. Excerpts from this act are referred to in this management plan.

- Part III Development Control, Environmental Impact Assessment, Review and Monitoring
- Schedule Section 14 Prescribed Developments

The Project Team will adhere to all environmental requirements prescribed within the Environment Act and conditions of the contract.

According to the Kiribati Government's Environmental Act 2007, an Act to amend the Environment Act 1999, the Project will be required to prepare a Basic Environmental Impact Assessment, which is equivalent to the Asian Development Bank's Initial Environmental Examination and the World Bank's Environmental Management Plan (EMP). According to the Act, the Ministry of Public Works and Utilities (MPWU) will need to comply with the environmental requirements as detailed in the EMP and secure an Environment Licence from the Ministry of Environment, Lands, and Agricultural Development (MELAD).

### 2.2 ENVIRONMENTAL LICENCES

Licence Number	ELA 036/10
Licence Holder	Ministry of Public Works and Utilities
Description of allowed activity	Kiribati Road Rehabilitation Project
Site	Betio, South Tarawa and Buota
Date Granted	18 July 2013
Amendment to Clause 24	2 April 2015

<b>Licence Number</b>	<b>ELA 123/12</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Ambo-Taborio (Steward) Causeway
Date Granted	9 October 2012

<b>Licence Number</b>	<b>ELA 084/13</b>
Licence Holder	MPWU
Description of allowed activity	Repair of Causeway (Remedial Work to Dai Nippon Causeway)
Site	Dai Nippon Causeway
Date Granted	9 August 2013

<b>Licence Number</b>	<b>ELA 075/13</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Ananau Causeway
Date Granted	3 October 2013

<b>Licence Number</b>	<b>ELA 118/12</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Nanikaai (lagoon side)
Date Granted	9 October 2013

<b>Licence Number</b>	<b>ELA 034/14</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Teaoraereke (Opposite Catholic HQs)
Date Granted	4 July 2014

<b>Licence Number</b>	<b>ELA 035/14</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Antebuka (Between KPC HQs and FEMA lodge)
Date Granted	4 July 2014

<b>Licence Number</b>	<b>ELA 52/14</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Taborio (Between WGMC and Neways Ltd)
Date Granted	4 July 2014

<b>Licence Number</b>	<b>ELA 53/14</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Banraeaba (adjacent to KAP II Seawall)
Date Granted	4 July 2014

<b>Licence Number</b>	<b>ELA 69/14</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Bikenibeu
Date Granted	11 September 2014

<b>Licence Number</b>	<b>ELA 121/12</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Temaiku (Opposite Taiwan Technical Mission)
Date Granted	11 March 2014

<b>Licence Number</b>	<b>ELA 122/12</b>
Licence Holder	MPWU
Description of allowed activity	Seawall Construction
Site	Temaiku (Kabin Temaiku)
Date Granted	6 May 2014

Copies of Environmental Licences in Attachment G

## **3.0 MANAGEMENT OF WORKS**

### **3.1 ENVIRONMENTAL POLICY**

McConnell Dowell Constructors Ltd will lead by example in ensuring that statutory and contractual requirements are met and positive environmental outcomes are maintained. To achieve this, the McConnell Dowell Board have developed an Environmental Policy that directs the level of commitment to positive environmental performance for the Project (refer **PEP Att2-3**, MMS # **010-J005-100**). Attachment B

The Policy makes the following key commitments:

- Continuous Improvement;
- Prevention of Pollution;
- Compliance with Legal and Other Requirements; and
- Sustainable Development.

### **3.2 ENVIRONMENTAL MANAGEMENT SYSTEM**

McConnell Dowell operates an ISO 14001 accredited Environmental Management System (EMS) that forms part of the integrated McConnell Dowell Management System (MMS). Attachment B

### **3.3 ENVIRONMENTAL MANAGEMENT FRAMEWORK**

#### **3.3.1 Contractors Environmental Management Plan**

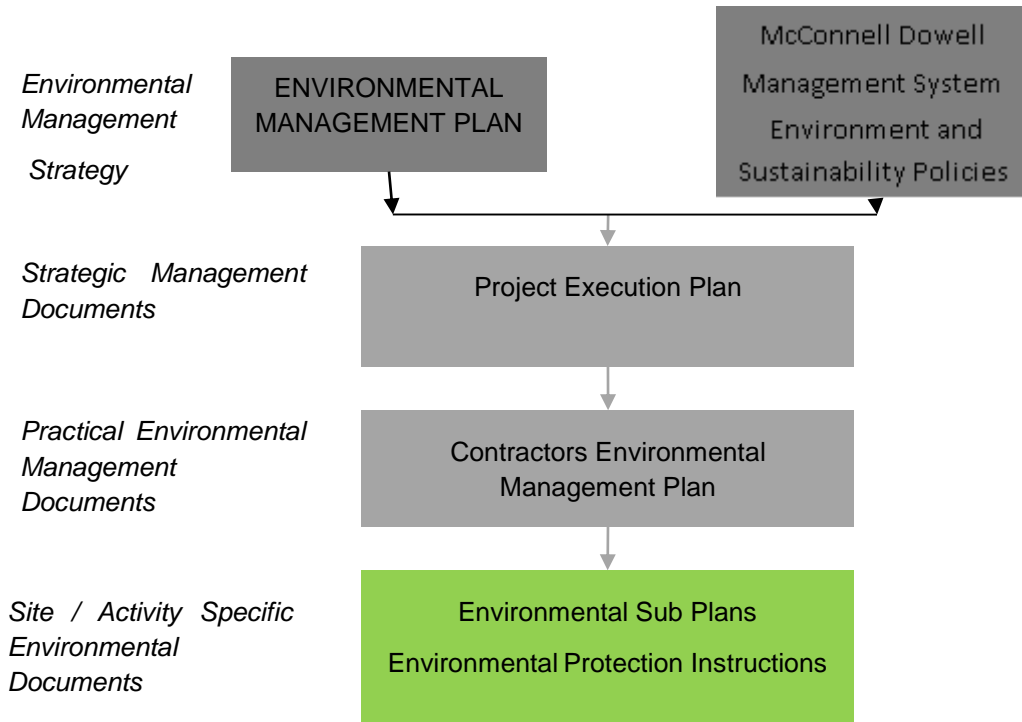
This Contractors Environmental Management Plan (CEMP) forms part of the overarching Project Execution Plan (PEP) for the delivery of the Project. It provides a system and set of procedures to ensure that McConnell Dowell establishes and maintains sound and effective controls to manage potential environmental impacts throughout the Project, and wherever practicable, realise opportunities for enhanced environmental outcomes.

Effective environmental management needs to be proactive rather than reactive. The CEMP is therefore based upon a risk management approach to identify and assess environmental risk associated with each element of the project and to implement appropriate mitigation strategies to minimize the subsequent risk.

The approach to managing environmental risk is shown graphically in Figure 3 Environmental Management Approach

.

**Figure 3 Environmental Management Approach**



### 3.3.2 Environmental Protection Instructions

Environmental Protection Instructions (EPIs) provide detailed summaries of the method of implementation for a number of environmental controls discussed in this CEMP (e.g. air quality, noise, vibration, spill response, and erosion and sediment control) New EPIs will be developed by the HSE Advisor for the Project and changing conditions as required.

EPIs will be prepared to cover the following environmental control areas that have been identified from the initial risk assessment process completed during the planning phase:

- Erosion and Sediment Control;
- Noise Emissions;
- Atmospheric Emissions;
- Vibration;
- Storage, Maintenance and Refuelling of Machinery;
- Storage and Handling of Hazardous Substances;
- Disturbance to Terrestrial Flora and Fauna;
- Disturbance to Aquatic Flora and Fauna
- Disturbance to Cultural Heritage:
- Land Contamination; and
- Energy and Water Consumption.

### **3.3.3 Environmental Sub Plans**

Environmental Sub Plans will be set up for the Project as required by work packages and client requirements. The following Environmental Sub Plans will be available for the Project:

- Noise and Vibration Management Plan;
- Flora and Fauna Protection Plan;
- Water and Wastewater Management Plan;
- Dust Suppression Management Plan; and,
- Spill Response Plan.
- Storage & Handling of Hazardous Substances

### **3.3.4 Construction Execution Plans**

Construction Execution Plans (CEPs) are developed by the Project Team in advance of work commencing, providing a technical explanation of the requirements for each major work activity. The Plans are developed in consultation with the HSE Advisor to ensure that any required environmental or sustainability controls are embedded into the processes adopted. Blank form: Attachment C

### **3.3.5 Job Safety and Environmental Analysis**

The Job Safety and Environmental Analysis (JSEA) is a tool used to determine health, safety and environmental risk associated with tasks prior to commencing a component of work. Each task is reduced to individual steps and the potential hazard associated with each step identified. Risk mitigation steps are attributed to each hazard, thus providing a detailed plan for installation of control measures. Blank form: Attachment C. Current approved JSEAs in Attachment H

The main strength of JSEAs prepared on the job is their ability to focus on unique risks at a particular point in time — for example, current weather conditions, resources, experience of workers and impact with other jobs, people or environment..

## **3.4 ENVIRONMENTAL RESPONSIBILITIES**

### **3.4.1 Leadership**

Environmental protection is a core value in the position descriptions of all staff. From Project Manager down, all staff will lead by example, setting the highest standards for environmental management and performance.

The following personnel have key accountabilities in the development, approval and execution of the works in accordance with this Plan:

- Project Manager
- Superintendent and Supervisors
- Project and Site Engineer
- HSE Advisor
- Employees and Sub-Contractors

Environmental responsibilities for each of the nominated Project Team representatives are outlined below:

### **3.4.2 Project Manager**

The Project Manager has ultimate responsibility to:

- Promote at all times McConnell Dowell's policies, procedures and standards relating to environmental management and ensure that they are complied with;
- Ensure sufficient resources are available to achieve the Project's policy, objectives and targets and that those resources have sufficient skills to conduct the roles competently;
- Report performance on a regular basis to internal and external stakeholders;
- Report significant incidents internally and externally;
- Ensuring the Project achieves legislative compliance;
- Provide leadership in the ongoing development and implementation of the CEMP;
- Ensure that all staff and sub-contractors are familiar with and implement all relevant environmental control measures;
- Periodically review all environmental control measures to assess their ongoing applicability and effectiveness;
- Encourage all employees to maintain acceptable standards of environmental work practices and foster awareness of environmental matters; and
- Encourage the reporting of incidents, events and other concerns and ensure appropriate feedback on proposed corrective actions.

### **3.4.3 Superintendent and Supervisors**

The Superintendent and Supervisors have the responsibility to:

- Provide effective hands on environmental leadership;
- Ensure work is undertaken in accordance with all environmental requirements; and
- Participate in incident and non-conformance report investigations and ensure that corrective and preventative actions are implemented effectively.

### **3.4.4 Project and Site Engineers**

The Project and Site Engineers have the responsibility to:

- Provide effective environmental leadership;
- Ensure designs are undertaken in accordance with the requirements of the Project Scope and Technical Requirements, CEMP and relevant environmental requirements;
- Ensure design has minimal environmental impact;
- Participate in incident and non-conformance report investigations and ensure that corrective and preventative action proposed are implemented effectively.

### **3.4.5 HSE Advisor**

The HSE Advisor has the responsibility to:



- Be the leader for the Project's environmental obligations, and the first contact for internal and external environmental communication;
- Oversee all environmental management aspects of the Project;
- Provide environmental leadership;
- Review, update and ensure implementation of this CEMP and other applicable environmental documentation for the Project;
- Ensure all staff and contractors are inducted and trained in environmental issues and controls;
- Ensure all required monitoring and reporting is undertaken; and
- Investigate and report environmental incidents and non-conformance and close out as required.

#### **3.4.6 Employees and Sub-Contractor**

All employees and subcontractors engaged on the Project are required to operate within the requirements of this CEMP and relevant environmental legislation.

### **3.5 CONTRACTOR INDUCTION PROCESS**

All site personnel are inducted to the project. All activities have a Construction Execution Procedure (CEP) and associated Job Safety & Environmental Analysis (JSEA) The CEP is developed with potential environmental impact acknowledged. The JSEA describes the environmental hazard and how it is mitigated.

Prestart Talks, Toolbox talks, START cards, Weekly Inspections, Hazard Reports all help to minimise impact on environment

## **4.0 ENVIRONMENTAL REQUIREMENTS**

### **4.1 HAZARD AND RISK IDENTIFICATION**

During Project execution, the principal objectives of risk management are to develop and monitor the implementation and effectiveness of risk treatments and to identify and evaluate changes in the risk profile of the Project.

A Project HSE Risk Register of all identified hazards and risks will be created and kept as a live document on the Project site (refer **PEP Att13-1 Project HSE Risk Register**). This register will be updated where appropriate through the lifetime of the Project.

### **4.2 ENVIRONMENTALLY SENSITIVE AREAS**

Environmental issues generated by the construction of the Project may affect environmentally sensitive areas surrounding the site. Environmentally sensitive areas are as follows:

- Coastal areas of Kiribati – characterised by:
- white sandy beaches;
- reef flats / reef patches;

- lagoons;
- mangrove forests;
- Live Coral formations
- extensive reef mud flats
- sea grass beds.
- Drinking water resources
- Communities adjacent to the project

Management techniques applicable to these environmentally sensitive areas will be detailed in full, within the Environmental Sub Plans, CEPs, JSEAs and Environmental Protection Instructions.

Environmentally sensitive areas and the appropriate management techniques will be communicated to all staff during their initial site induction training and reinforced when the scope of works to be completed may have a degree of impact upon the identified sites.

### 4.3 UXO

Areas specified to have UXO will be surveyed by a specialist contractor as per Section 1900 of the Specifications and disposed of as directed by the Engineer.

UXO retrieved will be transported to the Police Station bunker at Betio and placed behind sand bag walls as directed by the Engineer

An Explosive Ordnance Disposal (EOD) expert will be nominated by the Contractor, of qualifications acceptable to the Engineer, who will direct disarming/defusing, transport and final placement operations and have sole responsibility to declare areas site safe. Staff engaged in detection and clearance shall have received formal and recognized training.

The current scheduled timing of commencement of works in areas where there is a risk of UXO is approximately October 2014.

The specialist contractor's Project Management Plan is included in Attachment I

### 4.4 AC PLANT OPERATION & MAINTENANCE

See attachment F for details of AC Plant operation & maintenance including:

- Details of the plant, its origins, processes used & environmental standards that it has conformed to during its previous use
- A description of the bag house including operation & maintenance manual including description of procedure for disposing of filtered dust
- Layout & location of AC Plant with respect to nearby dwellings as provided by the Government
- Description of surfacing of the AC Plant area.

### 4.5 ENVIRONMENTAL ISSUES AND IMPACTS

The table below summarizes the environmental impacts associated with the activities during the Kiribati Road Rehabilitation Project. The identification of risks and risk management options are in accordance with Procedure E009-020-100 Risk Management (Environment).

**Table 1 Summary of Environmental Impacts without mitigation**

Issue	Contributing Factor / Root Cause	Potential Impact	Risk Likelihood / Severity
<b>Erosion &amp; Sediment Control</b>	Soil instability and erosion	Increase amount of sediment lost from the site; Affected vegetation area Damage to marine habitat	Likely / Minor
	No regular monitoring, routine maintenance	Drainage and erosion problems during the Maintenance and Rehabilitation of road	Possible / Minor
<b>Wastewater Discharges</b>	Uncontrolled sediment and excessive ground disturbance	Impact of storm water containing sediment on streams and coasts including suspended sediment in the lagoon	Likely / Moderate
	Discharged storm water without passing through geotextile silt traps	Impact of contaminated runoff water	Likely / Moderate
<b>Atmospheric Emissions</b>	Unstable stockpiles and spoil-heaps; unidentified dumping location	Dust emissions and runoff especially during dry periods	Almost Certain / Moderate
	No dust suppression	High levels of particulates may cause inconvenience to adjacent community	Likely / Moderate
<b>Noise Emissions and Vibration</b>	Generation of noise from construction activities without noise buffer in place	Nuisance from noise at construction especially during night time	Likely / Minor
	Excessive vibration due to construction activity	Nuisance	Likely / Minor
<b>Archaeological / Visual Amenity</b>	Disturbed sensitive natural areas	Negative impacts on sensitive ecosystem or the natural environment; Potential harm to mangroves during the course of construction activities	Almost Certain / Moderate
	Improper Material Management	Impacts of materials delivery and waste disposal;	Likely / Moderate
	Minimum standards of site supervision and vehicle and plant operation in event of any utility disruption	Damage to water, power and telecommunication lines	Likely / Moderate
<b>Disturbance to Cultural Heritage</b>	Intentional excavation of artifacts of cultural or historic importance including military graves	Serious damage to cultural site (i.e. ceremonial sites and burial grounds)	Likely / Moderate
	Unauthorized excavation activities undertaken to build or extend homes	Rupture aesthetic and archaeological value of damaged area	Likely / Moderate
<b>Solid and Liquid Wastes</b>	Generation and improper disposal of offsite wastes	Land and water contamination from solid waste and sewerage	Likely / Moderate

Issue	Contributing Factor / Root Cause	Potential Impact	Risk Likelihood / Severity
<b>Hazardous Chemicals and Dangerous Goods</b>	Improper storage, handling and disposal of dangerous goods; Unsegregated chemicals	Land and water contamination from hazardous chemicals	Almost Certain / Moderate
<b>Fuel and Oil Spills</b>	Improper storage and handling of fuel and lubricants; no oil-water separator in place	Hazards relating to fuel and oils etc.; Potential intrusion to water source	Almost Certain / Moderate
	Refuelling of vehicles and equipment within 20 meters away from the lagoon areas	Contamination of water bodies by potential oil spill	Almost Certain / Moderate
<b>Social Impact</b>	Lack of road safety practices	Increased rate of accidents during and after construction of the road; Increased vehicle speed amongst complacent drivers	Likely / Moderate
	Destruction of aesthetic value in terms of social disturbance	Damage to personal and community property	Likely / Moderate
	Direct benefit from the project	Generation of job opportunities and training for local people; Additional revenue to the community through the payment of local permits and resource consents;	Almost Certain / Insignificant
<b>Disease</b>	Hygiene	Illness	Likely / Moderate
<b>Social Violence</b>	Alcohol / Drugs	Poor relations with community	Possible / Moderate
<b>Damage to Marine Environment</b>	Siltation / Pollution	Damage to marine flora / fauna. Imbalance to ecosystems	Possible / Moderate
<b>Water Conservation</b>	Excessive burden on water supply	Disruption to supply to community	Unlikely / Major
<b>Importation of pests and diseases</b>	Importation of aggregate	Damage to Flora & Fauna	Likely Moderate

## 5.0 ENVIRONMENTAL MITIGATION

Management strategies for the mitigation of environmental aspects for the project are listed in the following tables and represent the best available for the Project team:

**Table 2 Environmental Management Plan: Design/Pre-Construction Phase**

Environmental Issue and Objective	Mitigation Measures	Treatment during Pre-Construction
<b>DESIGN/PRE-CONSTRUCTION PHASE</b>		
<p><b>Protection of (sensitive) Natural areas</b></p> <p><i>To minimize negative impacts on sensitive ecosystems, or the natural environment</i></p>	<ul style="list-style-type: none"> <li>Identify potential environmentally sensitive / natural areas</li> <li>Locate optional construction sites/activities away from them.</li> <li>Ensure construction personnel are aware of locations of sensitive areas and avoid them</li> <li>If the proposed construction passes close to these areas, include temporary fences to restrict machines and activities from encroaching in the area.</li> </ul>	<ul style="list-style-type: none"> <li>The project road alignments were inspected and consultations undertaken. While most of the road alignment passes through densely populated areas where natural ecosystems have been substantially altered by human habitation, some widening is to take place adjacent to mangrove stands, including some being established under the KAP. Improved revetment of the road is required, and this will be achieved by the construction of a small wall using cement filled sand-bags, well clear of the mangrove stands. Environmental sub-plan 025-Y002-2536 Flora &amp; Fauna for the construction phase provides for protection of the mangroves during the course of construction activities.</li> </ul>
<p><b>Road Safety</b></p> <p><i>To avoid accidents during and after construction of the road</i></p>	<ul style="list-style-type: none"> <li>Include occupational health and safety requirements are in place on construction sites in work camps. .</li> <li>Include install of lights and cautionary signs in hazardous areas.</li> <li>Ensure that footpaths and pull-off bays along roads; through villages; and near markets, schools, and other community facilities are included in the design.</li> <li>Include safety instructions for the construction activities in the contract documents.</li> </ul>	<ul style="list-style-type: none"> <li>Villages and sections of road passing hospitals, schools and manaebas have been treated as speed control zones. With these zones, the following safety measures are provided (i) "village gateways", which display the village name and speed limits (in English and I-Kiribati) and have road markings to give the impression of constriction and encourage slower driving (ii) marked pedestrian walkways, (iii) speed humps (iv) raised kerbs, (v) marked bus bays and (vi) lighting. In all other areas, safety measures include footways on either side of the road wherever space permits, appropriate signage and trimming of vegetation where required to achieve adequate visibility.</li> <li>Project Traffic Management Plan covers road safety during construction</li> </ul>

Environmental Issue and Objective	Mitigation Measures	Treatment during Pre-Construction
	<ul style="list-style-type: none"> <li>• Ensure that speed bumps near schools, hospitals, and markets are included in the road design.</li> <li>• Ensure sufficient visibility along the road section according to standard specifications.</li> </ul>	
<p><b>Cultural Heritage</b>  <i>To avoid any serious damage to cultural heritage site (i.e., ceremonial sites and burial grounds)</i></p>	<ul style="list-style-type: none"> <li>• In case a cultural heritage site is identified during the construction, the Contractor will cease all work immediately and notify the PSC</li> </ul>	<ul style="list-style-type: none"> <li>• Consultations confirm that artifacts of cultural or historic importance do not occur during excavation activities that are undertaken regularly to build or extend homes and public buildings. However, if artifacts are found, the engineer will be notified and the artifacts protected from damage.</li> </ul>
<p><b>Community Concerns</b>  <i>To minimize social impact of an relocation or resettlement of people</i></p>	<ul style="list-style-type: none"> <li>• Plan activities to avoid/minimize displacement of residents</li> <li>• Discuss the projected impacts and negotiate proposed measures in advance with the affected community; work with local government officers and NGOs</li> <li>• Conduct surveys before activities commence to identify all members of affected populations</li> <li>• Identify other land based natural resources, infrastructure and services which may be lost to the affected community</li> <li>• Identify suitable land (if possible, land having the same clan ownership) for resettlement.</li> </ul>	<ul style="list-style-type: none"> <li>• Consultations have taken place with groups of villagers according to a publicized schedule. These identified little some concerns related to design and minor concern over construction activities. Concerns related to design were (i) the need to correct existing problems with drainage (ii) possible removal of trees to make way for footways and (iii) some concerns over land acquisition issues. These are addressed by (i) provision for drainage as described above, (ii) allowing for retention of trees in designing footways and (iii) development and implementation of a comprehensive land acquisition plan, including a 100% inventory of losses and enactment of specific compensation policies acceptable to affected persons, the government and the financing agencies.</li> <li>• Where practicable, labor based techniques have been provided for. This includes the prescribed concrete surfacing of feeder roads, which makes use of labor rather than heavy machinery.</li> </ul>
<p><i>To minimize damage to personal and community property</i></p>	<ul style="list-style-type: none"> <li>• Ensure works will be restricted to the 'right-of-way' of the existing road;</li> <li>• Ensure projected impacts and proposed measures have been discussed in advance with the affected community; work with local government officers and non-governmental organizations.</li> </ul>	<ul style="list-style-type: none"> <li>• Project impacts and proposed mitigation measures have been discussed with communities and councils during design.</li> <li>• Detailed surveys of affected property will be completed by Lands Department Officers prior to construction</li> </ul>

**Table 3 Environmental Management Plan: Construction and Maintenance Phase**

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
<b>CONSTRUCTION PHASE</b>						
<p><b>Social or Community Concerns</b></p> <p><i>To minimize social disturbance and maximize community benefits from the project:</i></p>	<ul style="list-style-type: none"> <li>• Advise the local community of project plans in advance of construction, and involve them in planning, as necessary</li> <li>• Avoid or minimize disturbances near living areas, schools, hospitals, etc.</li> <li>• Control runoff and manage sediments near cultivated areas</li> <li>• Abide by the laws of the Republic of Kiribati relating to employment and use of labor</li> <li>• Maintain liaison with community representatives and arrange for the involvement of community groups where practicable.</li> <li>• Consult local residents on selection of trees &amp; shrubs to be planted</li> <li>• AC Plant to be located as far away from communities as possible</li> <li>• Dust suppression where required</li> <li>• Lighting directed away from communities</li> <li>• Noise minimised</li> <li>• Community Liaison concerning UXO investigation, transportation &amp; storage</li> </ul>	Along road alignment	During mobilization and commencement of construction activities in the communities	Minimal (part of standard design practices).	Contractor	MPWU/CSC
<p><b>Soil Instability and Erosion</b></p> <p><i>To minimize the amount of sediment lost from the site</i></p>	<ul style="list-style-type: none"> <li>• Reduce the time excavated drainage channels remain unsupported</li> <li>• Keep vegetation clearing to a minimum</li> </ul>	All areas where clearing is required & shore protection	Continuous	Minimal (part of standard construction practices)	Contractor	MPWU/CSC

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>Place geotextile silt traps as appropriate</li> <li>At sites where vegetation is removed, encourage re-vegetation immediately after construction activity finishes</li> <li>Exposed face on shore protection to be kept to a minimum. Work face to be covered with cloth end of shift</li> </ul>					
<p><b>Controlling Sediment</b></p> <p><i>To minimize impact of storm water containing sediment on streams and coasts including suspended sediment in the lagoon</i></p>	<ul style="list-style-type: none"> <li>Install silt traps at drainage ditches and materials stockpiles</li> <li>Re-vegetate all areas where vegetation was removed which are not to be paved after final land shaping</li> <li>Limit ground disturbance to areas of a workable size</li> <li>Schedule construction to minimize areas of soil disturbance during heavy rain</li> <li>Contain or isolate construction areas where practical, using a bund or trench, from other surface runoff. Clean and rehabilitate when construction is complete</li> <li>Discharge of sediment bearing contaminated water to the lagoon is prohibited</li> <li>Minimise exposed face on shore protection works. Cover with cloth at end of shift</li> <li>Stockpiles to be managed to avoid washing out sediment</li> </ul>	All areas where clearing is required. & shore protection	Continuous	Minimal (part of standard construction practices).	Contractor	MPWU/CSC
<p><b>Damage to Marine Habitat due to Seawall toe construction</b></p> <p><i>No Damage to Marine Environment</i></p>	<ul style="list-style-type: none"> <li>Refer to Shore Protection JSEA / CEP for detail</li> <li>Excavators to work on the beach at low tide</li> <li>Toe excavation to be separated from lagoon / ocean using a bund. No flow of water / silt from toe to ocean</li> </ul>	Shore Protection locations specified on contract drawings	Continuous	Minimal – standard procedure	Contractor	Engineer



Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>All plant to be well maintained. Prestart check before shift starts</li> <li>Spill kits available</li> <li>Immediate removal of excavated material to dry land</li> </ul>					
<b>Water supply</b> <i>No disruption to water supply</i>	<ul style="list-style-type: none"> <li>Minimise use of clean water for construction purposes (incl. concrete)</li> <li>Collect rainwater for contractor's camp, workshop and office, Betio lodge 5 x 10,000 ltr water tanks installed, Contractor's office 5 x 10,000 and 1 x 5,000 lt water tanks installed. Contractor's workshop 4 x 5,000 lt water tanks installed.</li> <li>2 x UV water purifying systems installed at the Contractor's camp and workshop for employee drinking water and ice</li> <li>Use seawater/brackish water for dust suppression.</li> <li>Avoid contamination to water lens</li> <li>Betio Causeway Bridge modifications to be carried out without disturbing existing water supply</li> <li>No UXO disposal adjacent to watermain except in emergency public safety situations</li> <li>The only connection the Contractor has made to the PUB water supply is at the Project Office and this is turned off as we are utilizing harvested rain water for all services.</li> </ul>	Throughout project	Continuous	Minimal	MacDow site	MacDow Audits
<b>Controlling Storm water</b> <i>To minimize the impact of contaminated runoff water:</i>	<ul style="list-style-type: none"> <li>Pass storm water run-off from construction areas through geotextile silt traps before discharge into culverts or drainage systems.</li> </ul>	All areas where clearing is required.	Continuous	Minimal (part of standard construction practices)	Contractor	MPWU/CSC

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>• Store oil and bituminous products in a contained location away from drainage ditches.</li> <li>• Shore protection works involving fresh concrete – no work during heavy rain</li> <li>• Bitumen equipment washed down on designated wash down slab</li> <li>• Betio Causeway Bridge Modifications to ensure to fresh concrete or grout falls into the ocean</li> </ul>					
<p><b>Management of Stockpiles and Spoil-heaps</b>  <i>To minimize dust and runoff</i></p>	<ul style="list-style-type: none"> <li>• Locate stockpiles with regard to minimizing impact on local communities</li> <li>• Ensure proper drainage to isolate the sites.</li> <li>• Ensure stockpile or spoil-heap locations do not block surface runoff or drainage lines</li> <li>• Cover spoil-heap or stockpiles if prolonged exposure is envisaged, to minimize erosion and sediment runoff</li> <li>• Place geotextile silt traps around materials stockpiles on ocean / lagoon side within 20m of shoreline</li> <li>• Adequate provision shall be made to ensure that no stockpiles are able to release material into the sea or lagoon.</li> <li>• Mitigation measures to be addressed specifically in JSEAs</li> <li>• Stockpile locations will be managed with consideration to the local community, who will be consulted beforehand if a proposed stockpile location has potential to cause nuisance.</li> <li>• Height of stockpile will be managed so as to minimize nuisance. Maximum 5m height</li> </ul>	<p>Dumping areas and areas where materials are stored.</p>	<p>Continuous</p>	<p>Minimal (part of standard construction practices)</p>	<p>Contractor</p>	<p>MPWU/CSC</p>

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>AC Plant stockpiles located away from community</li> <li>Work on stockpiles limited on extremely windy days without rain</li> </ul>					
<b>Dust Control</b> <i>To minimize health risk or inconvenience due to dust production</i>	<ul style="list-style-type: none"> <li>Spray water on exposed surfaces in construction zones</li> <li>Ensure trucks are not overloaded when transporting friable materials.</li> <li>Speed limits for transportation</li> </ul>	Cleared areas, material transport	During dry periods	Minimal (part of standard design practices).	Contractor	MPWU/CSC
<b>Noise Control</b> <i>To minimize nuisance from noise</i>	<ul style="list-style-type: none"> <li>Use modern and well maintained equipment</li> <li>Carry out noisy construction activities during daylight hours (0700 – 1900) or as per environmental license conditions</li> <li>Advise local people, schools, hospitals, etc., when there will be unavoidable noise activities.</li> <li>AC Plant to be located away from community</li> </ul>	All construction areas, access routes	Continuous	Minimal (part of standard design practices).	Contractor	MPWU/CSC
<b>Material Management</b> <i>To minimize impacts of materials delivery and waste disposal</i>	<ul style="list-style-type: none"> <li>Place silt fences around materials stockpiles</li> <li>Develop safety measures to avoid loss of load from trucks</li> <li>Implement methods to reduce dust emission from the loads</li> <li>Implement site safety plan with regard to vehicle operation and use. Restrict peak traffic delivery.</li> <li>See Environmental sub plan 025-Y004-2536 – Dust Management Plan</li> <li>Materials for shore protection to be transported in method minimizing environmental impact</li> </ul>	All materials management areas	Continuous	Minimal (already part of standard design practices)	Contractor	MPWU/CSC

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>• Construction waste to be minimized</li> <li>• Recycle concrete products</li> <li>• UXO to be stored / disposed of as directed by the engineer in locked, protected bunker &amp; kept behind sand bag walls</li> <li>• MSDS to be available</li> <li>• Incoming Hazardous Goods Risk Assessments to be carried out &amp; recorded</li> <li>• Correct signage to be used</li> <li>• Segregation guidelines to be followed</li> </ul>					
<p><b>Offsite and Waste Management</b></p> <p><i>To prevent / minimize contamination from solid wastes and sewerage</i></p>	<ul style="list-style-type: none"> <li>• Contain all solid waste within construction sites and remove to landfill</li> <li>• Prepare procedures for managing spillages to ensure rapid containment, immediate site cleaning and appropriate disposal (as for depots and workshops)</li> <li>• Remove all inorganic solid waste to landfill</li> <li>• All plant, vehicles and machinery to be removed from Kiribati at the end of the contract, ensuring that no unserviceable items of equipment are left on the island</li> <li>• Install onsite toilets with appropriate management arrangements for effluent and collection of sludge to prevent any release of contamination into the soil. Liaise with the Public Utilities Board for appropriate collection and disposal of sludge</li> <li>• SOP Storage &amp; Handling of Hazardous Substances describes procedure to dispose of waste off island (025-L008-2536)</li> </ul>	All off-sites storage and disposal sites	Continuous	Minimal (part of standard design practices).	Contractor	MPWU/CSC

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
<p><b>Storage and handling of fuel and lubricants</b></p> <p><i>To minimize hazards relating to fuel, oil, paints etc.</i></p>	<ul style="list-style-type: none"> <li>Fuel and oil will be stored in dedicated areas at least 20 m away from the lagoon areas.</li> <li>Where fuel in excess of 5,000 liters is stored on site, it will be stored in sealed tanks on a concrete base that is bunded to hold 110% of the tank capacity.</li> <li>Precautions to be taken during refueling including the use of drip trays.</li> <li>No refueling within 20m of shoreline except when working on causeways</li> <li>Nominate authorized personnel for fuel handling</li> <li>Develop procedures for cleaning up accidental spills.</li> <li>Report any major spill in the vicinity of the lagoon to MELAD.</li> <li>Collect and dispose of all waste oil, oil and fuel filters off island.</li> <li>AC Plant fuelling carried out on wash down slab</li> </ul>					
<p><b>Safety and Health</b></p> <p><i>To ensure maximum safety of construction personnel and local residents</i></p>	<ul style="list-style-type: none"> <li>Ensure all occupational health and safety requirements are in place on construction sites and in work camps</li> <li>Refer to the Project Traffic Management Plan.</li> <li>Install cautionary signs in hazardous areas</li> <li>Establish footpaths and pull-off bays along roads through villages, near markets, schools and other community facilities .</li> <li>Enhance safety and inspection procedures</li> <li>Use Personal Protection Equipment (PPE)</li> </ul>	All construction sites.	Continuous	Minimal (part of standard design practices).	Contractor	MPWU/CSC

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
<p><i>General Health and Safety Awareness for construction workers</i></p>	<ul style="list-style-type: none"> <li>Refer to Project Safety Management Plan specifying responsibilities and authorities within the Contractor's staff for adhering to safety and health requirements, to cover adherence to occupational health and safety requirements, provide for use of personal protective equipment, provide for lighting and warning signs at hazardous areas, set rules for operation of vehicles and equipment by authorized personnel, set procedures for safe handling of toxic and hazardous materials, set arrangements for first aid and emergency procedures, provide for posting notices about medical assistance and location of emergency equipment, set schedules for regular checking of adherence to the plan and train staff to familiarize them with the plan their obligations to implement it and main areas of risk to workers and others</li> <li>Education on basic hygiene practices to minimize spread of tropical diseases</li> <li>A bi-monthly IEC programme is in place to Increase workers' HIV/AIDS and STD awareness, including information on methods of transmission and protection measures. Programme to be regularly monitored for effectiveness.</li> <li>Prohibit usage of drugs and alcohol on construction sites as per McConnell Dowell Drug &amp; Alcohol Policy &amp; Programme. Random testing to be carried out on the project as well as where there is reasonable cause to test and after any incident.</li> </ul>	<p>Construction camps and all worksites</p>	<p>Continuous</p>	<p>Minimal (part of standard design practices).</p>	<p>Contractor</p>	<p>MPWU/CSC</p>
<p><b>Disruption of utilities</b></p>	<ul style="list-style-type: none"> <li>Ensure high standards of site supervision and vehicle and plant operation to reduce risks of damage to water, power and telecommunication lines</li> </ul>	<p>All construction sites</p>	<p>Continuous</p>	<p>Minimal (part of standard design practices).</p>	<p>Contractor</p>	<p>MPWU/CSC</p>

Environmental Issue and Objective	Mitigation Measures	Locations	Timeframe	Estimated Mitigation Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>Prepare procedures for rapid notification to the Public Utilities Board and assistance with re-instatement, in the event of any disruption</li> <li>Permit to dig procedure to be followed</li> </ul>					
<b>Site de-commissioning</b> <i>To minimize ongoing impacts after construction is completed</i>	<ul style="list-style-type: none"> <li>Rake or loosen all compacted ground surfaces</li> <li>Ensure that waste and surplus materials are removed from site, or otherwise dealt with according to the wishes of landowners or local residents</li> <li>Excavate &amp; remove any contaminated soil from fuel depots / workshops, remove and reshape the area.</li> <li>All laydown areas &amp; construction camps / yards to be left in their original state at the end of the project</li> </ul>	All construction and camp sites	After completion of construction	Minimal (part of standard design practices).	Contractor	MPWU/CSC
<b>Importing Aggregate</b>	<ul style="list-style-type: none"> <li>Approval from Quarantine Office</li> <li>Fumigation Certificate</li> </ul>	Place of embarkation	Each shipment	Included	Contractor	Ministry of Agriculture

## 5.1 MANAGEMENT STRATEGIES AND MITIGATION

**Table 4 Matrix of CEMP Responsibilities**

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
<b>1. LANDSCAPING AND VEGETATION REMOVAL</b>		
Vegetation removal from areas containing permanent and temporary works	Mitigation options listed in Sub Plan on Flora and Fauna Protection Plan (025-Y002-2536).	McConnell Dowell (Project Manager, Superintendent, HSE Advisor)

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
	<p>Topsoil management will be implemented (e.g. even spreading over subsoil, transport and handling in dry conditions only to prevent run-off and erosion)</p> <p>Use of Native plants found traditionally and historically within the area for habitat and site restoration</p> <p>Oil spills will be contained and removed</p> <p>Workers must wear proper PPE</p>	
<b>2. EROSION AND SEDIMENTATION</b>		
<p>Construction of site establishment areas and other earth working activities.</p>	<p>JSEA and EPI for Soil Erosion, Sedimentation and Surface run-off (025-L001-2536) finalized and released to all concerned employees</p> <p>Stabilization of earthworks will be performed</p> <p>Silt curtains erected where applicable</p> <p>Surface run off will be diverted away from a water body</p> <p>Provision of catchments areas for surface water run-of</p>	<p>McConnell Dowell (Site Supervisors, HSE Advisor and Project Engineer)</p> <p>JSEA are to cover all environmental aspects such as soil erosion, sedimentation and Surface run-off when this is of a concern</p>
<p>Excavation of road and removal of road debris/ material</p>	<p>JSEA and EPI for Soil Erosion, Sedimentation and Surface run-off (025-L001-2536) finalized and released to all concerned employees</p> <p>Stabilization of earthworks will be performed</p> <p>Silt curtains erected where applicable</p>	<p>McConnell Dowell (Site Supervisors, HSE Advisor and Project Engineer)</p>
<p>Seawall Construction</p>	<p>Minimise exposed work face</p> <p>Cover with cloth end of shift</p>	<p>McConnell Dowell (Site Supervisors, HSE Advisor and Project Engineer)</p>
<p>Disposal of Excavated Material</p>	<p>JSEA and EPI for Soil Erosion, Sedimentation and Surface run-off (025-L001-2536) finalized and released to all concerned employees</p> <p>Stabilization of earthworks will be performed</p>	<p>McConnell Dowell (Site Supervisors, HSE Advisor and Project Engineer)</p>



Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
	Silt curtains erected where applicable Surface run off will be diverted away from a water body	
<b>3. FUEL AND OIL SPILL</b>		
Spillage during handling or Transport	Provision of Sub Plan on Spill Response Plan (025-Y005-2536) Spill Response Management Training Refuelling and related activities will be handled with care. Drip Trays to be utilized under plant and equipment where a leak of fluids is expected. (except water from air conditioning units) Provision of oil and fuel spill control kits Provision of PPEs for all personnel handling fuel and oils Spill and handling mitigation options elaborated in CEMP and in EPI 025-L007-2536 entitled "Maintenance and Refuelling of Machinery" Fuelling at AC Plant to be carried out on bunded wash down slab	McConnell Dowell (Compliance HSE Manager, Site Supervisors, tanker operators) Training of relevant personnel on Chemical Handling and Hazardous Materials management to be conducted by Environmental Manager
Leaks from damaged piping, storage tanks or equipment	Spill Management Training Refuelling and related activities will be handled with care. Provision of oil and fuel spill control kits Provision of PPEs for all personnel handling fuel and oils Spill and handling mitigation options elaborated in CEMP and in EPI 025-L007-2536 entitled "Maintenance and Refuelling of Machinery" Bitumen transfer in bunded area Qualified people to transfer bitumen & fuel Plant to be checked daily & recorded	McConnell Dowell (Designated work site foreman, Compliance HSE Manager, Site Supervisor)

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
<b>4. DUST GENERATION</b>		
Gravel and Sand Stockpile areas.	Cover smaller stockpiles where required  Personnel working in high dust areas must wear the appropriate PPE's (dust mask, etc) at all times  Undertake work in a manner that would aim to, as much as possible, reduce the amount of generated dust  Other mitigating measures elaborated in CEMP and likewise contained in Sub Plan on Dust Suppression Plan (025-Y004-2536).  AC Plant to be located away from communities	McConnell Dowell (Site foreman and Compliance HSE Manager)
Pavement Construction – Dust generated by skid steer broom.	Broom to be housed within a guard to reduce dust being flown up in the air	
Truck haul routes and areas subjected to high traffic.	Water Trucks with sprinkler systems to travel haul routes and other areas on fixed daily time intervals.  Personnel working in high dust areas must wear the appropriate PPE's (dust mask, etc.) at all times  Undertake work in a manner that would aim to, as much as possible, reduce the amount of generated dust  Ensure vehicle operators observe speed limits in order to reduce dust generation  Other mitigating measures elaborated in CEMP and likewise contained in Sub Plan on Dust Suppression Plan (025-Y004-2536).  Speed limits for transportation	McConnell Dowell (Compliance HSE Manager, water truck drivers)
Transport of dried excavated materials.	Keep vehicle speeds limited in order to reduce dust generation on unsealed road surface	McConnell Dowell (Compliance HSE Manager, Truck Drivers)

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
	Other mitigating measures elaborated in CEMP and likewise contained in Sub Plan on Dust Suppression Plan (025-Y004-2536).	
<b>5. NOISE</b>		
Noise from various construction activities	Locate parking areas/storage handling areas away from adjoining properties Always consider noise control when planning for activities in each work area Retain as much natural vegetation onsite for it to act as a natural noise barrier Engage community when any noise complaint is received and again after control measures have been applied –inform the Environmental Manager where genuine concerns are confirmed. Other mitigating measures elaborated in CEMP and likewise contained in Sub Plan on Noise and Vibration Management Plan (025-Y001-2536). AC Plant to be located away from communities	McConnell Dowell (Compliance HSE Manager, Site Supervisor, equipment operators, Environmental Manager)
<b>6. VIBRATION</b>		
Vibration from various construction activities	Carry out operations to minimise impact of vibration Personnel working in high vibration areas are required to wear PPE's Other mitigating measures elaborated in CEMP and likewise contained in Sub Plan on Noise and Vibration Management Plan (025-Y001-2536).	McConnell Dowell (Compliance HSE Manager)
<b>7. DRINKING WATER QUALITY</b>		
Utilization of clean fresh drinking water from refilling station	Regular monitoring of drinking water quality and general maintenance of water sources Rain water to be collected for cleaning vehicles	McConnell Dowell

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
	Saltwater to be used for dust suppression & concrete production where possible technically	
<b>8. CONSTRUCTION WASTES</b>		
Generation of general construction waste from various project activities and personnel onsite	Store construction waste at a secure and properly designated area Waste will be segregated and stored in storage area and prevented from coming into contact with either soil or water until removed. Waste not allowed to accumulate Provision of rubbish bins at key locations (e.g. frequently used areas) throughout the project facilities Any observed waste must be immediately and properly disposed of Stored waste must not be exposed to groundwater or soil Personnel handling construction waste must wear PPE's such as protective gloves at all times Other mitigation options outlined in EPI 025-L013-2536 entitled " Solid and Liquid Waste" Refer to Storage & Handling of Hazardous Substances (025-L008-2536)	McConnell Dowell (Compliance HSE Manager, all personnel)
<b>9. SPOILS / EXCAVATED MATERIALS</b>		
Generation of spoils from construction activities particularly excavated materials	Provision of a spoil disposal area Management of spoils to prevent erosion All personnel handling waste materials must wear PPE such as protective gloves at all times	McConnell Dowell (Environmental Manager, Compliance HSE Manager, Project Engineer and Site Supervisors)
<b>10. DANGEROUS GOODS AND HAZARDOUS CHEMICALS</b>		

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
<p>Storage and Handling of Dangerous Goods</p>	<p>Implement proper segregation of dangerous goods according to classes and risks</p> <p>Refer to McConnell Dowell's Central MSDS database for MSDS used on site. Ensure incoming chemicals have their own MSDS before receiving on site</p> <p>Provision of bunded areas for all hazardous chemicals to be used on site. All chemical containers should be closed when not in use.</p> <p>Chemicals must not be stored in unventilated areas, or where the vapours may be accumulated in overhead air voids. Adequate precautions must be taken to prevent the ignition of flammable/combustible vapours.</p> <p>Chemicals must not be stored outside, in direct sunlight, or near sources of heat or sparks.</p> <p>Incompatible materials must not be stored together</p> <p>Chemicals must not be stored or handled near water and on floor drains without being provided with secondary containment.</p> <p>All personnel who work in areas where hazardous chemicals are stored, dispensed, handled, or used must complete HAZMAT training and wear proper PPE for handling specific chemicals.</p> <p>Other mitigation options outlined in EPI 025-L008-2536 entitled "Storage and Handling of Hazardous Substances"</p> <p>Incoming Hazardous Substance Risk Assessment to be carried out</p>	<p>McConnell Dowell (Compliance HSE Manager, Environmental Manager and all personnel)</p>
<p>Generation of Hazardous Waste</p>	<p>Preparation of an inventory list of all hazardous goods and their corresponding wastes located onsite</p> <p>Hazardous waste will be stored in properly labelled bins with cover.</p> <p>Proper labelling and MSDS will be attached to the containers of hazardous wastes</p> <p>Any spills, leaks or residues from containers should be cleaned up promptly and properly disposed.</p>	<p>McConnell Dowell (Compliance HSE Manager, Environmental Manager and all personnel)</p>

Project Phase / Activity	Management Strategies and Mitigation	Responsible Person/Unit
Disposal of Hazardous Waste	Hazardous waste to be removed from island outlined in 025-L008-2536 entitled "Storage and Handling of Hazardous Substances"	MacDow
Green Waste	Mulch to compost for landscaping areas Food waste to pigs	MacDow
UXO Storage & Disposal	As directed by the engineer behind sand bag wall in Police bunker at Betio	MacDow
<b>11. SOCIAL IMPACT</b>		
Hiring & training of local workers	Coordinate with the local community for the list of qualified workers	McConnell Dowell (Project Manager)
Provide livelihood for the host community	Minimise impact on adjacent communities.	McConnell Dowell (as required)
Complaints Management (Grievance Redress Mechanism)	Raised through public consultations and sponsored meetings, the community is able to address the issues pertaining to the environment (may it be minor, major/more substantial or land use issue)	McConnell Dowell (Project Manager, Environmental Manager, as required)

## **6.0 TRAINING AND COMPETENCY**

### **6.1 OVERVIEW**

The environmental competency requirements for all staff positions are contained in the relevant Position Descriptions. Recruitment and procurement processes are conducted with the aim of engaging personnel with the required competency and experience.

All personnel will receive training of a type and level of detail that is appropriate for the environmental aspects of their routine and emergency work assignments. As a minimum, all personnel are required to satisfactorily complete the Project Induction Training. Other mechanisms of communicating environmental controls are through the JSEAs, Tool Box Talks and Pre-Start Meetings.

### **6.2 INDUCTION TRAINING**

The Project Induction includes a presentation and overview of the requirements of this CEMP and in particular the requirements of the issue specific Environmental Sub Plans, incident response, emergency procedures and spill management. The purpose of the induction is to ensure that, at a minimum employees and subcontractors:

- Understand the importance of conforming with the environmental policy and procedures and to the requirements of this CEMP;
- Are aware of the significant environmental values and issues within the vicinity of the Project and the potential impact of the construction activities on these values;
- Understand the sustainable activities and environmental control measures available to assist the Project to minimise its environmental impact;
- Understand the potential consequences of a breach of an environmental regulation or consent/condition;
- Are aware of the roles and responsibilities relating to environmental management for the Project; and
- Are aware of the emergency response and incident procedures.

Attendance records of all training and briefing sessions will be maintained by the Project Team.

### **6.3 TOOLBOX TALKS**

Toolbox Talks are conducted weekly for all staff & site personnel to deliver specific training in an aspect of work or controls, such as spill kit training or correct erection of a silt fence, to provide site personnel with ongoing environmental training and information throughout the Project.

### **6.4 PRE-START MEETINGS**

Pre-start meetings are used by the supervisors and foremen to explain the work to be done in the upcoming shift. All operational aspects of the task are discussed including environmental issues and controls, particularly if there are new hazards or if there has been a recent incident.

## 7.0 MONITORING, EVALUATION AND REPORTING

### 7.1 ENVIRONMENTAL MONITORING

Environmental monitoring is required during the construction of the Project to ensure that no adverse impact on the environment occurs. In general, monitoring is conducted on a routine basis; however, additional monitoring may be required in the event of a complaint or incident, or before, during and after a significant rain event to monitor erosion and sediment controls.

The HSE Advisor is responsible for ensuring the onsite environmental monitoring takes place.

### 7.2 ENVIRONMENTAL INSPECTIONS

Weekly Environmental Compliance Inspections are managed by the Compliance HSE Manager and carried out by staff members in pairs and rotated. The findings of the Inspection are recorded on **Site Inspection Environmental Checklist – Weekly** (MMS # **025-F002-2536**), in which required remedial actions are recorded, including a responsibility and timeline for close out. These shall be monitored to ensure that they are closed out in the required time frame.

### 7.3 AUDITS

Environmental audits are to be carried out throughout the course of the project by New Zealand Environmental Manager, and reported in accordance with the requirements of **Audit Internal** (MMS # **010-D008-000**) procedure. In addition to these internal audits, McConnell Dowell will cooperate with any external environmental audits as required and conducted by an authorised party in relation to compliance with contract or legislative requirements.

### 7.4 REPORTING REQUIREMENTS

Reporting requirements will evolve as the Project progresses. In the early phase emphasis will be on the establishment of systems, controls and competence of all personnel, while later the emphasis will shift to monitoring performance. When nearing completion (as applicable) the focus will be on final reports to address approval requirements.

The HSE Advisor is responsible for managing the Project environmental reporting. The Project Manager is responsible for submitting the reports required externally.

McConnell Dowell will comply the monitoring measures prior to the commencement of rehabilitation works until the completion of the project. Field Monitoring Checklist provided in the EIA report shall be used during the monitoring process.

Incidents, Near Misses, Hazards and sustainability data are reported as and when they occur. Results are collated and submitted to MacDow head office and the client on a monthly basis.



## 7.5 ENVIRONMENTAL MONITORING PLAN

**Table 5 Matrix of Environmental Monitoring Plan**

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
<b>CONSTRUCTION PHASE</b>						
<b>Protection of Ecosystems, Flora &amp; Fauna</b>  <i>Minimise impact on ecosystems due to construction activity</i>	<ul style="list-style-type: none"> <li>Weekly Environmental Checklist</li> <li>Reporting Procedure</li> <li>JSEA / TBT / Prestart meetings to address risk</li> </ul>	Throughout Project	<ul style="list-style-type: none"> <li>Zero non-compliance</li> <li>Zero Incidents</li> </ul>	Weekly checklists, Reporting as required	CEMP	MacDow
<b>Protection of Cultural Heretage</b>  <i>Protect Cultural Heritage. Avoid Damage or loss of Artifacts.</i>	<ul style="list-style-type: none"> <li>Notification to Engineer</li> </ul>	Throughout Project	<ul style="list-style-type: none"> <li>Zero loss or harm to Cultural Heritage</li> <li>Zero complaints</li> </ul>	Constant	CEMP, TBTs	MacDow
<b>Social or Community Concerns</b>  <i>Minimization of social disturbance and maximize community benefits.</i>	<ul style="list-style-type: none"> <li>Verbal or formal complaints.</li> </ul>	Along the entire road alignment	<ul style="list-style-type: none"> <li>Zero complaints</li> <li>Zero Non-compliance with Statutory Regulations</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.  MELAD	MacDow

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>Project progress reports.</li> </ul>					
<b>Soil Instability and Erosion</b> <i>Minimization of the amount of sediment lost from the site.</i>	<ul style="list-style-type: none"> <li>Inspection</li> <li>Visual check for sediment load and waste management procedures.</li> <li>Verbal or formal complaints.</li> </ul>	All areas where clearing is required.	<ul style="list-style-type: none"> <li>Construction and waste materials should be controlled.</li> <li>Waste can only be disposed of at approved sites.</li> <li>Zero non-compliance</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	MacDow
<b>Controlling Sediment</b> <i>Minimizing storm water containing sediment from discharging into watercourses</i>	<ul style="list-style-type: none"> <li>Inspection</li> <li>Visual and field Inspection.</li> <li>Verbal or formal complaints.</li> </ul>	All areas where clearing is required.	<ul style="list-style-type: none"> <li>Erosion should be controlled.</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<b>Controlling Storm water</b> <i>Minimizing contaminated runoff water.</i>	<ul style="list-style-type: none"> <li>Visual check for water and</li> </ul>	All areas where clearing is required and	<ul style="list-style-type: none"> <li>No increase of drainage problems or water logged areas.</li> </ul>	Continuous (minimal costs, included in	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
	<ul style="list-style-type: none"> <li>drainage management.</li> <li>Verbal or formal complaints.</li> </ul>	construction sites.	<ul style="list-style-type: none"> <li>Waste can only be disposed of at approved sites.</li> </ul>	standard supervision)		
<b>Management of Stockpiles and Spoil-heaps</b> <i>Manage to minimize dust and runoff.</i>	<ul style="list-style-type: none"> <li>Visual field checks.</li> <li>Verbal or formal complaints.</li> </ul>	Stockpile areas	<ul style="list-style-type: none"> <li>Construction and waste materials should be controlled.</li> <li>Waste can only be disposed of at approved sites</li> <li>Maximum stockpile height 5m</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<b>Air Quality and Dust Control</b> <i>Ensure there is no health risk or inconvenience due to dust production:</i>	<ul style="list-style-type: none"> <li>Visual field checks.</li> <li>Verbal or formal complaints.</li> </ul>	Cleared areas,	<ul style="list-style-type: none"> <li>MacDow Environmental Protection Procedures</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<b>Noise control</b> <i>Ensure nuisance from noise is minimized.</i>	<ul style="list-style-type: none"> <li>Visual field checks.</li> <li>Verbal or formal complaints</li> </ul>	All construction areas, access routes	<ul style="list-style-type: none"> <li>MacDow Environmental Protection Procedures</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.  Acceptable working hours to be followed	ES and Engineer of MPWU

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
<b>Waste Management</b> <i>To prevent / minimize contamination from solid wastes and sewerage:</i>	<ul style="list-style-type: none"> <li>Visual field inspections</li> <li>Verbal complaints by workers</li> </ul>	All construction sites.	<ul style="list-style-type: none"> <li>All solid waste contained within construction sites and removed to landfill</li> <li>Spillages managed according to stated procedures</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<b>Storage and handling of fuel and lubricants</b> <i>To minimize hazards relating to fuel, oil, paints etc.</i>	<ul style="list-style-type: none"> <li>Visual field inspections</li> <li>Verbal complaints by workers</li> <li>Daily Plant inspections</li> <li>Weekly Environmental Inspections</li> </ul>	All construction sites.	<ul style="list-style-type: none"> <li>Fuel and oil stored at least 20 m away from the lagoon areas.</li> <li>Quantities more than 5,000 liters stored in sealed tanks on a concrete base that is bunded to hold 110% of the tank capacity.</li> <li>All workshops provided with oil and water separators.</li> <li>Vehicles and machinery not refueled within 20 m of the lagoon. Apart from those working on causeways</li> <li>Authorized personnel only handling fuel</li> <li>Accidental spills dealt with according to set procedures.</li> <li>Immediate reporting of any spills into lagoon to MELAD.</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
			<ul style="list-style-type: none"> <li>Collect and dispose of all waste oil, oil and fuel filters outside Kiribati</li> <li>Follow 025-L008-2536 entitled "Storage and Handling of Hazardous Substances"</li> </ul>			
<b>Safety and Health</b> <i>Ensure maximum safety of construction personnel and local residents.</i>	<ul style="list-style-type: none"> <li>Visual field inspections</li> <li>Verbal complaints by workers</li> </ul>	All construction sites.	<ul style="list-style-type: none"> <li>MacDow Health &amp; Safety Procedures</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<i>Health and Safety Awareness for construction workers.</i>	<ul style="list-style-type: none"> <li>Verbal and formal complaints by communities and workers.</li> </ul>	Construction camps	<ul style="list-style-type: none"> <li>As per Project Health &amp; Safety Management Plan</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<b>Disruption of utilities</b>	<ul style="list-style-type: none"> <li>Verbal and formal complaints by communities and workers.</li> </ul>	Construction camps	<ul style="list-style-type: none"> <li>As listed in the EMP.</li> </ul>	Continuous (minimal costs, included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
<b>Site de-commissioning</b> <i>Minimize ongoing impacts after construction is completed</i>	<ul style="list-style-type: none"> <li>Counting of replanting.</li> <li>Agreement with Communitie</li> </ul>	All construction and camp sites	<ul style="list-style-type: none"> <li>No increase of soil erosion</li> <li>Vegetation, if any to be restored</li> </ul>	After completion of construction (included in standard supervision)	Joint monitoring by the MPWU Engineer and the Contractor.	ES and Engineer of MPWU
<b>Water Supply</b> <i>No disturbance to supply</i>	<ul style="list-style-type: none"> <li>Complaints</li> </ul>	Throughout	<ul style="list-style-type: none"> <li>Watermain not to be damaged</li> </ul>	Ongoing	MacDow	MPWU
<b>Materials Management</b> <i>No chemical spills</i>	<ul style="list-style-type: none"> <li>Reporting procedure</li> <li>Weekly Inspection</li> <li>Prestart Checks</li> <li>Material Hazard Assessments</li> </ul>	All	<ul style="list-style-type: none"> <li>MSDS</li> <li>No spills</li> </ul>	ongoing	MacDow	MPWU
<b>Importing Aggregate</b> <i>No Biosecurity issues</i>	<ul style="list-style-type: none"> <li>Fumigation certificate for all loads</li> </ul>	Fiji	<ul style="list-style-type: none"> <li>Kiribati Ministry of Agriculture specified</li> </ul>	Each load	MacDow or their supplier	MPWU

Environmental Issue and Objective	Ways for Verification	Location	Standards / Criteria	Duration / Frequency and Estimated Costs	Implementation	Supervision
<b>OPERATION &amp; MAINTENANCE PHASE</b>						
<b>Rehabilitation and Road Maintenance Practices</b>  <i>Avoid drainage problems, aggravation of erosion, and reduced visibility.</i>	<ul style="list-style-type: none"> <li>Monitoring &amp; Inspection</li> </ul>	Entire road section	<ul style="list-style-type: none"> <li>Routine and Periodic Maintenance</li> <li>Ensure maintenance crews operating to correct standard</li> </ul>	As per contract	MacDow	MacDow

## 7.6 COMPLIANCE WITH ENVIRONMENTAL LICENCE

In addition to compliance with the measures in the above table and with the Environmental Licence (Licence application # **ELA 036/10**) issued on 26 November 2012 by the Ministry of Environment Lands and Agricultural Development, McConnell Dowell shall carry out the following monitoring measures which are also integrated in the Sub Management Plans:

**Table 6 Compliance with Environmental Licence**

Licence Condition(s)	Compliance Measures / Reference Documents	Requiring Authority
<b>General</b>		
Excavation or mining aggregates including sand, gravel and reef mud to supply the rehabilitation of the road and to construct seawall is prohibited.	A separate Environmental Licence been secured to allow the use of excavated aggregates	
Public complaints shall be communicated to MELAD during the rehabilitation stage.	Complaints Register	MELAD
Notify in writing two weeks prior the commencement of construction		MELAD
Compliance with EMP; copy of CEMP shall be submitted for approval before construction	025-J002-2536 PEP Att 14-1 Contractor's Environmental Management Plan	MELAD
Request approval for the importation of aggregates		Quarantine Office
Secure certified document from the country of origin to prove that aggregates have been treated and are free from pests and diseases and invasive alien species		Quarantine Office
Aggregates (sand and gravel) imported or sourced locally shall be stock piled with fence in a secured area 20 meters away from the shoreline, flow of storm water, drainage courses and low grounds	Disturbance to Aquatic Flora & Fauna (EPI 025-L003-2536)	Civil Engineering Unit
Hazardous materials (coal tar, fuel, oil and lubricants) shall be stored in a secured area with a roof and concrete base that is bunded to hold any spillages	Spill Response Plan (Doc.# 025-Y005-2536) Storage & Handling of Hazardous Substances (EPI 025-L008-2536)	Civil Engineering Unit
Asphalt mixing plant shall be kept for operation in a secured area at least 20 meters away from the shoreline		
Aggregate stockpiling and hazardous materials storage areas shall be secured with approval for any State Land or shall deal directly with landowners	Dust Suppression Management Plan (Doc.# 025-Y004-2536)	Lands Management Division; Landowner
<b>Construction Phase</b>		
PUB water shall not be utilised for dust control and washing of equipment and machineries, except for concrete production and rollers	Water and Wastewater Management Plan (Doc.# 025-Y003-2536)	PUB CEO
Noise and vibration levels must be acceptable and does not unreasonably interfere with health or comfort of any person. Night working hours restricted to Sunday to Thursday, only in areas where consultation has occurred.	Noise and Vibration Management Plan (Doc.# 025-Y001-2536)	MELAD



Licence Condition(s)	Compliance Measures / Reference Documents	Requiring Authority
Aggregate depot must use geotextile silt fences or traps and sediment barriers, must not occupy an area of more than 200m <sup>2</sup> and height not more than 3 meters from the ground	Soil Erosion, Sedimentation & Surface Run-Off (EPI 025-L001-2536)  Dust Suppression Management Plan (Doc.# 025-Y004-2536)	
Hazardous materials shall be stored as per good practice. Spill incidents must be reported immediately. Contaminated soil shall be decontaminated and remove off the island. Waste and debris shall be contained and no waste to be dumped in the sea or lagoon.	Spill Response Plan (Doc.# 025-Y005-2536)	Civil Engineering Unit
Surplus materials and demolishing wastes shall be reused where possible		MELAD
Wastewater from concrete mixing shall not be discharged into the sea or marine habitat	Water and Wastewater Management Plan (Doc.# 025-Y003-2536)	
Dust and fumes must not interfere with the health and comfort of any person and important ecosystem	Dust Suppression Management Plan (Doc.# 025-Y004-2536)	
Spraying of water on site and on the road to reduce dust	Dust Suppression Management Plan (Doc.# 025-Y004-2536)	
Impact or damage to land and coastal vegetation (Mangrove ecosystem) must be avoided	Flora and Fauna Protection Plan (Doc.# 025-Y002-2536)	
Visible signs during the day and night must be put up at construction sites	Flora and Fauna Protection Plan (Doc.# 025-Y002-2536)	
<b>Post Construction Phase</b>		
Notify one month prior to the completion of the expansion of the rehabilitation works		MELAD
Waste and debris, hazardous materials shall not be left along the road side after the completion of the project	Solid and Liquid Waste (EPI 025-L013-2536)  Visual Amenity (EPI 025-L016-2536)	
Imported machineries shall be removed	Storage, Maintenance & Refuelling of Machinery (EPI 025-L007-2536)	
Proper decommissioning / landscaping and rehabilitation of temporary construction yards	ELA 036/10 18 Jul 13	MELAD
Final inspection		MELAD
<b>Monitoring</b>		
Undertake monitoring according to Environmental Monitoring Plan Section 7.5 of CEMP		
Dust and noise level to be monitored regularly		



## 8.0 INCIDENT REPORTING AND INVESTIGATION

### 8.1 RECORDING OF INCIDENTS

All environmental incidents shall be reported and recorded in accordance with **Incident Reporting and Investigation** (MMS # **020-E004-100**). The cause of all incidents will be subject to an investigation, convened by the HSE Advisor to determine the root cause(s) of the incident and to ensure that remedial / corrective actions are able to be implemented to ensure a repeat of the incident is avoided.

In the event of a spill to water, the Project Team will immediately report the incident or as soon as practical to the Client's rep and provide records of the incident, response and corrective actions as required.

In the event of an environmental incident, the Project Team will notify the Client's rep with notification within 7 days and will provide records of the incident, response and corrective actions as required.

A summary and review of incidents for the duration of the Project and for the relevant month shall be included in the Project Monthly Report.

### 8.2 HAZARDOUS SUBSTANCES

Hazardous substances will be stored on site appropriately as per good practice depending on the material and the nature of the hazard. All hazardous substances will be listed in the **Hazardous Substance and Dangerous Goods Register** (MMS # **020-F028-100**).

MacDow will initiate a detailed spill response procedure which communicates the responsibilities and management actions required in the event of a spill of a hazardous substance to the environment.

### 8.3 EMERGENCY RESPONSE AND FIRE SAFETY

The Emergency Response Plan (ERP) to be produced for the Project will take into account the following factors:

- the parts of the site or adjoining properties likely to be affected;
- the degree of predictability of the emergency;
- the likely speed of onset;
- the likely effect of the emergency;
- The contents of the Emergency Response Plan are to include:
- description of the potential emergency;
- the person responsible for actioning the ERP;
- the equipment required to deal with the emergency including rescue equipment;
- emergency contact numbers;
- direction to site workers and other affected persons on what they are required to do; and
- methods used to deal with the emergency (e.g. How to use specific equipment).

As necessary, emergency services such as Police, Fire Brigade, Ambulance, and a pollution response contractor are to be contacted and invited to visit the site in order to become aware of site access and other emergency considerations.

The ERP will incorporate the following components:

- Emergency contact list (for the above);
- Emergency Reporting Instructions;
- Emergency Muster Point Location;
- Emergency Response Co-ordinator Action Plan; and
- Emergency Personnel and Equipment.

The emergency response plan will be displayed in prominent locations around the site and employees will be trained in its requirements. All relevant Project personnel, subcontractors and relevant emergency agencies will be instructed and rehearsed, as appropriate, in the requirements of this Plan.

## 8.4 ENVIRONMENTAL SPILLS

The most effective spillage control system is prevention. To ensure that there is an adequate quantity and type of spill response equipment on site, the Project Team will evaluate the nature and frequency of various activities that pose the potential for spills / leaks. Based on these evaluations, the Project Team will obtain the adequate spill response material and equipment prior to work beginning on site.

As deemed necessary, the Project site will have spill kits that, at a minimum, will contain sufficient oil absorbent material to contain (e.g. oil absorbent boom) and cleanup any drips, leaks, or spills (e.g. ruptured hydraulic line) and plastic bags to contain any contaminated absorbents, soils, or wastes.

Spill kits for equipment maintenance, fuel storage areas, and fuel trucks will also contain sufficient absorbent material to contain the quantity of the material stored in the stationary containers (e.g. tanks, drums, cylinders) and equipment to cleanup (e.g. shovel, broom) and store used absorbent material.

# 9.0 MANAGEMENT REVIEW

## 9.1 CEMP REVIEW

This CEMP has been developed using the best available methods, procedures, expertise and experience available to McConnell Dowell Constructors. However, consistent with the philosophy of continuous improvement, there will be opportunities during the Project to implement new or improved procedures. Additionally, a specific review of the CEMP will be undertaken on an annual basis.

The root cause of many incidents leads to a need for action to prevent recurrence of that kind of incident. Where a repeat incident occurs or where there is a significant incident, an Environmental Alert may be issued. Environmental Alerts are used where incidents with broader implications and lessons that may be applicable to other Projects and Facility's are summarised and distributed to disseminate findings more widely. Environmental Alerts from other Projects and Facility's may also be relevant to this Project. Where applicable these lessons are communicated to the work force through Tool Box Talks and Pre-start Meetings.

Where any changes and improvement to working practices are identified through the investigation of environmental incidents, these will be assessed and incorporated into the EMP as part of the Incident Reporting and Investigation process.

## 9.2 STAKEHOLDER AND COMMUNICATIONS MANAGEMENT

### 9.2.1 Internal Communication

Communication regarding environmental issues and controls is important to ensure that management techniques are being adhered to and that employees have the opportunity to address concerns.

Environmental communication will primarily be through Pre-Start Meetings, weekly team meetings and Tool Box Talks; however it can also occur during site inspections or through members of the environmental or management teams.

### 9.2.2 External Communication

Communications and the management of complaints and enquiries are managed through the implementation of the Project Communications – Procedure – Internal and External (MMS # 300-E008-100).

The Project Manager is responsible for the conduct and coordination of communications with all key external stakeholders. Subject to any specific Project requirements, the Project Manager will be the key liaison person in dealing with:

- **Ministry of Public Works and Utilities (MPWU)** – as the implementing agency for the Project and will be responsible for the implementation and compliance with the EMP and Monitoring Plan.
- **Project Supervision Consultant (PSC)** – will be tasked for the day-to-day implementation and compliance. They will prepare quarterly progress reports based on findings of regular monitoring activities

Progress Reports which will include an overview of the status of the implementation of the EMP's and compliance to the national environmental regulations shall be submitted for information to the Ministry of Environment, Lands, and Agricultural Development (EDC-MELAD), the Asian Development Bank, and The World Bank if required.

### 9.2.3 Complaints Management

In the event that complaints relating to environmental management are received, the Project team will direct such complaints and enquiries to the HSE who will act on them.

Complaints will be recorded on **Environmental Incident / Event** (MMS # **020-F053-100**) form and entered into the Enquiry and Complaints Register. As a minimum, the following will be recorded:

- The date and time of enquiry / complaint;
- Personal details of the party lodging the enquiry / complaint (subject to privacy considerations);
- Nature of the enquiry or issue of concern;
- Outcome of complaint investigation and any remedial actions taken by the Project Team to cease the impact.

At the completion of the investigation, a summary of the findings and action taken will be provided to the party that lodged the complaint / enquiry.

#### **9.2.4 Grievance Redress Mechanism**

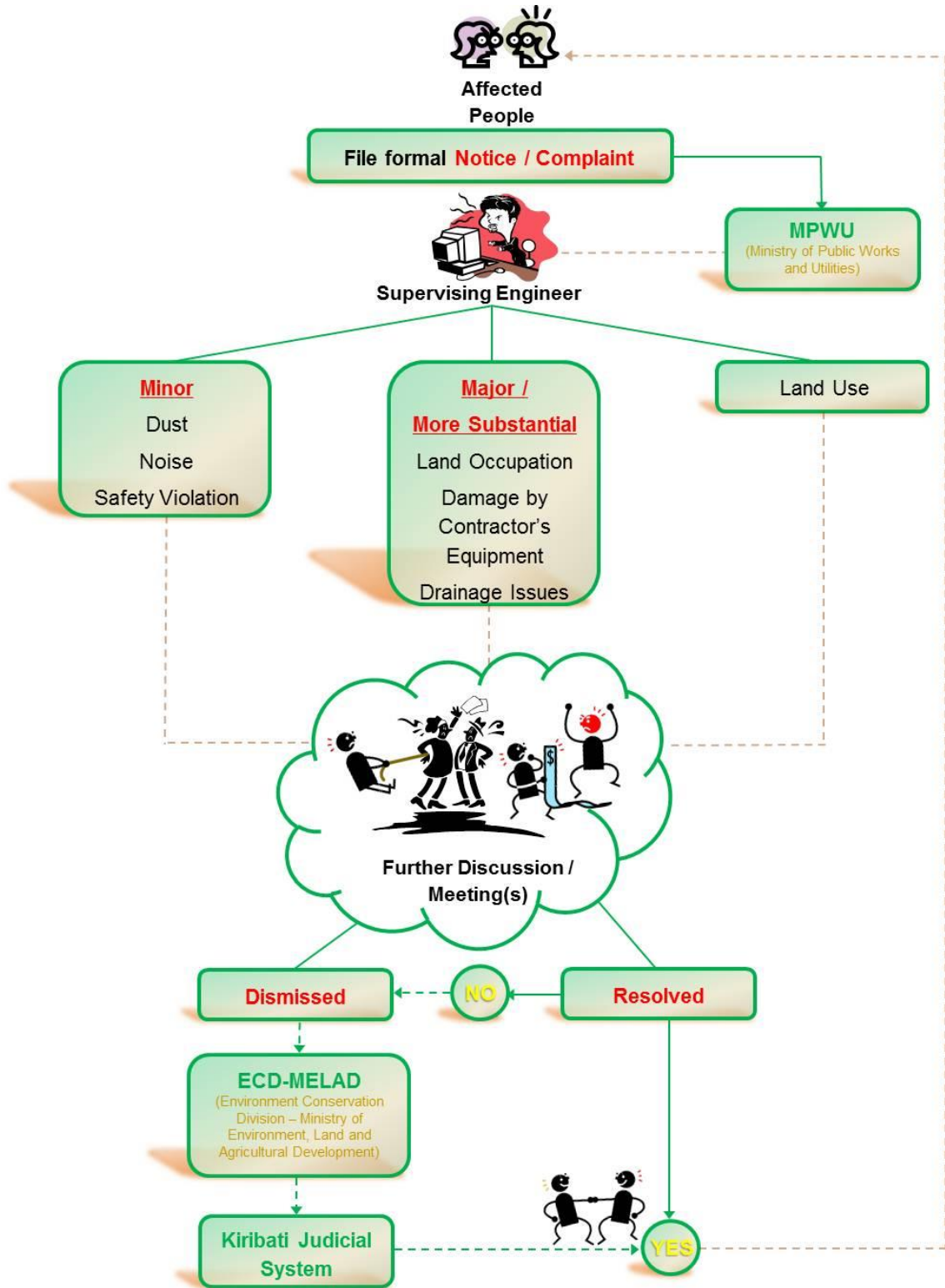
Issues and concerns from the stakeholders and community concerning the environment during the project duration may be submitted to the MPWU office.

This will be assessed and validated as genuine complaints by a Supervising Engineer.

Further discussion and meetings may be carried on before forwarding to EDC-MELAD.

In occasion where resolution is not granted, the issue/concern may be elevated to the Kiribati Judicial Courts for final settlement.

Figure 4 Grievance Redress Mechanism flowchart



## 10.0 REFERENCES

### Not included in this plan. Copies available on request

HSE Inspections and Monitoring	020-E001-100
HSE Performance Reporting	020-E006-100
HSE Risk Management	020-E008-100
Identification and Control of Nonconformity	017-E002-100
Incident Reporting and Investigation	020-E004-100
Project Communications – Internal and External	300-E008-100
Subcontractor Safety and Environmental Controls	020-E007-100

## 11.0 ATTACHMENTS

ATTACHMENT A – ENV Legal

ATTACHMENT B – Policies & Certification

ATTACHMENT C – Blank Forms

ATTACHMENT D – Sustainability Reporting

ATTACHMENT E – Environmental Hazard Identification Checklist

- Environmental Protection instructions standard
- Noise & Vibration Management Plan
- Flora & Fauna Protection Plan
- Water & Wastewater Management Plan
- Dust Suppression Management Plan
- Spill Response Plan
- Storage & Handling of Hazardous Substances

ATTACHMENT F – AC Plant Operation & Maintenance

ATTACHMENT G – Current Environmental Licences

ATTACHMENT H – Current Approved JSEAs

ATTACHMENT I – UXO