McCONNELL DOWELL CONSTRUCTORS LTD.

CLIENT: GOVERNMENT OF REPUBLIC OF KIRIBATI

PROJECT: KIRIBATI ROAD REHABILITATION PROJECT

LOCATION: TARAWA, KIRIBATI

PROJECT NO.: 2536

Environmental Protection Instruction

WATER & WASTEWATER MANAGEMENT PLAN

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Revision History

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1.0 INTRODUCTION

Kiribati is a coastal area widely covered with sandy beaches, lagoons, coral reefs, sea grass beds and mangrove forests. There are a number of ecosystems and marine organisms which are constantly threatened from various human activities on the areas.

Figure 1. Coastal area of Kiribati

In a recent case study on Water Resources Management in Kiribati with Special Emphasis on Groundwater Development using Infiltration Galleries, the major water sources in Kiribati and Tarawa in particular, are groundwater and rainwater. Fresh ground water occurrence of significant extent is, in general, limited to larger islands, where lenses of freshwater 'floating' on seawater have developed in the underground. The performance of the South Tarawa Water Supply system, which is serving more than 60% of the 38,000 people living on South Tarawa, is an exemplary case of groundwater supply using fully developed groundwater lenses (Bonriki and Buota). The use of groundwater resources as the main water source for the public water supply remains the cheapest and most appropriate option for Kiribati. However, other water sources such as desalination should be considered for future generations, as groundwater will, most probably, be insufficient to meet projected future water demands. (T. Metutera, 2002)

This Water and Wastewater Management Plan is prepared to satisfy the requirements of the Government of Republic of Kiribati during the implementation of contract conditions for Kiribati Road Rehabilitation Project. As stated, Part A Sub-clause 4.18 Condition under Protection of Environment, McConnell Dowell shall comply with all applicable national, local and environmental laws and regulations:

- Establish an operational system for managing environmental impacts;
- Carry out all of the monitoring and mitigation measures set forth in the Initial Environmental Impact Assessment and Environmental Management Plan;

McConnell Dowell shall submit monthly reports on the carrying out of such measures to "the Engineer".

2.0 OBJECTIVES

- To minimise the use of clean fresh water
- To minimise contamination of water on and in the vicinity of the work

3.0 TARGETS

Performance Criteria	Target	Measurement
Fresh Water Usage minimised	Use of water is optimised.	Consumption Reading(s)
Water Pollution	Zero non-compliance Zero incidents No contamination of the soil or waters on and in the vicinity of the works.	Complaints received Incident reports
Compliance with consent conditions	100%	No infringements or abatement notices
AC Plant Yard Water Quality	Maintain existing water quality levels for Hydrocarbons and Coliforms.	Monitored monthly – Coliform Testing Monitored every 6 months – Hydrocarbon testing

4.0 DEFINITIONS

Groundwater lens – In hydrology, a **lens** is a convex layer of fresh groundwater that floats on top of denser saltwater. It arises when rainwater seeps down through a soil surface and then gathers over a layer of seawater at or down to about 1.2m below ground level.

Wastewater – any water that has been adversely affected in quality by anthropogenic influence.

Wastewater discharge – also known as ***Effluent***, is an outflowing of water from a natural body of water, or from a human-made structure

5.0 RESPONSIBILITIES

- The Site Engineer and/or Supervisor is to implement the fuels, chemicals and waste management procedures.
- Project HSE Advisor is to:
  - monitor use of water.
  - inspect the site and the adjoining habitats.
  - notify any significant breaches.
  - inspect storage facilities and work practices and report non-conformances.
  - Monitor Water Quality Testing AC Plant Yard

6.0 LEGISLATIVE INFORMATION/REFERENCES

6.1 ENVIRONMENT ACT 1999 – PART 4: CONTROL OF POLLUTION

6.1.1 Causing pollution and noxious discharges

No person shall emit or cause to be emitted from any premises pollutant waste which unreasonably interferes with the health, welfare, convenience, comfort or amenity of any person.

6.1.2 Discharge of waste in circumstances in which it is likely to cause pollution

No person shall cause or allow waste or pollutant to be discharged in any position, place, land, beach, sea, lagoon or foreshore from which the waste or pollution is likely to result in pollution or in the unreasonable interference with health, welfare, convenience, comfort or amenity of any person.

6.1.3 Occupier of premises to take certain measures

The occupier of any premises shall:

- comply with any prescribed standard for the discharge of waste pollutant from such premises;
- take all reasonable and practicable measures to prevent or minimize the discharge of waste from such premises.

6.1.4 Occupiers of prescribed premises to obtain a license

Subject to the provisions of this Act, no person who occupies prescribed premises shall:

- cause or increase, or permit to be caused or increased, the discharge of waste or pollutant from the prescribed premises; or
- alter or permit to be altered the nature of the waste or pollutant discharged or raised from the prescribed premises, unless in accordance with any conditions of the license.

Any occupier of prescribed premises who contravenes the provisions commits an offence against this Act.

6.1.5 Application for license

An application for a license to discharge waste or pollutant from prescribed premises shall be made to the Secretary in the prescribed form and:

- be accompanied by the prescribed fee; and
- include any information, plans, specifications and other document and information as the Secretary acting in accordance with the advice of the Cabinet may require.

6.2 PERMIT TO OBTAIN BORE WATER

7.0 CONTROL METHODS

The key to the resolution of water problems is control - by water quality management planning, by the enforcement of national standards, by the licensing and policing of discharges, by following approved environmental operating procedures, and by good environmental awareness on the part of the public and other users.

Control, not prohibition, is the keyword: it is unrealistic to prohibit all discharges to our waterbodies. Instead, the careful, diligent control of discharges to water bodies will go a long way towards restoring and preserving the good water quality.

7.1 WATER USAGE

- McConnell Dowell shall be responsible for the provision of water required for the construction activities and for the tests. Potable water obtained from underground reserves is a scarce resource in Kiribati. This resource shall only be used for the purpose of the works.

- Services for water run throughout the site. McConnell Dowell may only access these services after making appropriate commercial arrangements with the relevant service owner or authority.
- All plant and machinery to be regularly serviced to ensure optimum fuel efficiency
- Water truck with sprinklers installed to be considered for use on roads & laydown areas.
- Seawater to be used for spraying the road
- Rain water is to be collected from office & lab roofs and workshop roof
- Alternate sources of water to be considered if available and if allowable under the contract.

7.2 SPILL MANAGEMENT

- An Emergency **Spill Response Plan** (**025-Y005-2536**) to be prepared and employees be inducted in its application.

7.3 WATER PROTECTION

- McConnell Dowell shall take all reasonable steps to protect the environment (both on and off the site) and to limit damage to people and property resulting from pollution and other results of operations.
- Ensure that emissions, surface discharges and effluent from the construction activities shall not exceed the values stated in the Contract or prescribed by applicable Laws.
- Asphalt Plant Yard - Install truck wash bay area fully bunded, that is connected to gravity separator to process gray water during plant operations. The gray water shall be filtered at the discharge area by filter cloth to separate gray water and sediments.

8.0 MONITORING

- Weekly inspection of the containment bunds and identify location of any spills
- Observation of plant maintenance and refueling activities and identification of any spills and oil/fuel leaks.
- Plant & Equipment daily prestart checks
- Asphalt Plant Yard – Monthly testing for water quality for coliform and hydrocarbons levels surrounding site tested every 6 months

9.0 EMERGENCY RESPONSE

- Advise the Supervisor or Site Engineer and the spill response team.
- Cease work contain the spill, cleanup and correct disposal in accordance with the Emergency Response Plan.
- If the failure does not involve an environment threatening spillage review the control measures and amend as necessary.
- Identify the contaminant and ensure correct removal and disposal as per legislative requirements.
- If the failure involves an environmental threatening spillage immediately notify parties as necessary in accordance with the Emergency Response Plan.

10.0 RECORDS

- Weekly inspections
- Incident reports of spills and their corrective actions.
- Record any preventive actions undertaken.
- Plant & Equipment daily prestart checks
- Sustainability Monthly report
- Monthly reporting AC Plant Yard water quality testing, monitor coliform levels onsite
- Every 6 months – Hydrocarbon Testing of surface water surrounding AC Plant yard area
- AC Plant Yard Truck wash bay service records – weekly