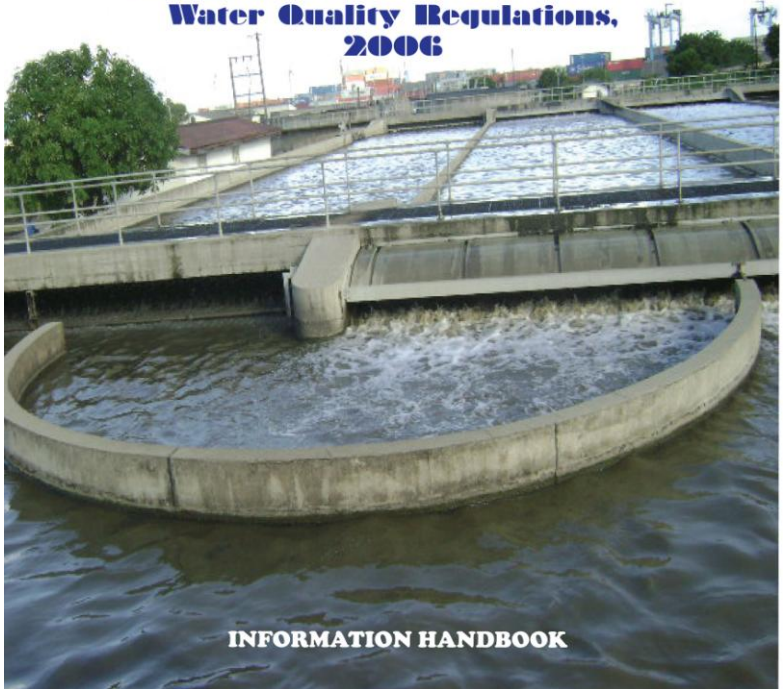




nema
NATIONAL ENVIRONMENTAL MANAGEMENT AUTHORITY

NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY

Water Quality Regulations, 2006



INFORMATION HANDBOOK

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PREFACE

The National Environment Management Authority, (NEMA) is the principal instrument of Government in the implementation of all policies relating to the environment. NEMA is established under the Environmental Management and Co-ordination Act, (EMCA) of 1999. The Act entitles every person to a clean and healthy environment, while requiring each person to safeguard and enhance the environment.

In order to implement EMCA, NEMA has developed a Strategic Plan with robust programmes and actions that focus on ways and means of improving our environment. The plan builds on the national priorities as spelt out in Vision 2030 and the MTP (2008 – 2012) among other international, national, sectoral and stakeholders considerations.

As envisaged in EMCA and the Strategic plan, NEMA in consultation with SERC has over the years developed several regulations to address various issues facing the environment. The EMC (Waste Management) Regulations 2006 is one among the various regulations already developed. The purpose of the regulations is to provide for guidelines, procedures and standards for the environmental governance to ensure compliance. The regulations also provide for licensing, monitoring and enforcement.

Poor solid waste management has contributed to environmental pollution resulting in reduced

environmental quality, risks to human health, loss of natural aesthetic value as well as strained existing waste management infrastructure. Lack of proper waste management systems has led to littering and illegal dumping. In addition, lack of waste segregation at source has led to mixed waste including domestic, medical as well as hazardous waste. The waste Management regulations seek to stop and reverse environmental pollution resulting from solid waste by providing mechanisms for managing solid waste. Such mechanisms include promotion of cleaner production technologies, segregation at sources, recycling and reuse.

This Handbook provides a brief of the gazetted Environmental Management and Coordination (Waste Management) Regulations 2006 in simplified language that is easy to understand. It is aimed at promoting awareness and understanding of the regulations with a view to enhancing compliance at all levels of the society in order to achieve a clean and health environment for all.

ACKNOWLEDGEMENT

The National Environment management Authority (NEMA) gratefully acknowledges the financial contribution of Regional Programme on Sustainable Management of the coastal zones of the countries of the Indian Ocean (RECOMAP) for supporting the production of this Water Quality Regulations Handbook. The handbook will enhance the understanding of the regulations by the various sectors as well as the general public thus enhancing the level of compliance to set standards and betterment of the environment.

Further the Authority appreciates the efforts of the team that analyzed and simplified the regulations and developed this information handbook.

ACRONYMS

BOC	Biological Oxygen Demand
COD	Chemical Oxygen Demand
EIA	Environmental Impact Assessment
EA	Environmental Audit
EU	European Union
EMCA	Environmental Management and Coordination Act
NEMA	National Environment Management Authority
RECOMAP	Regional Program on Sustainable Management of the Coastal Zones of the Countries of the Indian Ocean
TSS	Total Suspended Solids
VOC	Volatile Organic Compounds

1.0 INTRODUCTION

The Environmental Management and Coordination (Water Quality) Regulations 2006 were gazetted in September 2006. The regulations provide water quality standards for domestic consumption, irrigation and recreational purposes. In addition, the regulations provide standards for effluent discharge to the environment from various sectors.

The increasing environmental degradation especially pollution to water bodies necessitated the need to formulate the regulations. This is in line with section of EMCA,1999 which empowers the Minister to gazette guidelines and regulations to protect the environment as the need may arise. The regulations were also aimed at providing a common approach to the management of effluent discharge to the environment which had not been adequately addressed by other existing sectoral legislations.

The regulations cover a wide scope of sectors including: drinking water, industrial, agricultural, recreational, fisheries, wildlife and other purposes. The regulations prevent pollution to water sources, provide standards for domestic water, protect all water sources, ban use or access to critical water sources while providing limited access to others. The regulations also provide for licensing procedures for effluent discharge into the environment as well as penalties for non-compliance. In addition the regulations provide for

water quality monitoring through records and inspections. Since the inception of the regulation there is increased compliance to prescribed environmental standards and efforts to embrace recycling, pre-treatment of wastewater by various facilities.

Although the regulations have been in existence since 2006 awareness levels have remained low. As such the production of this booklet will enhance awareness and understanding of the regulation by all stakeholders thus contributing to improved compliance. It is anticipated that the quality of aquatic environment will be enhanced with continued implementation of the regulations.



2.0 GENERAL PROVISIONS OF THE REGULATIONS

2.1 Protection of Water Sources for Domestic Use

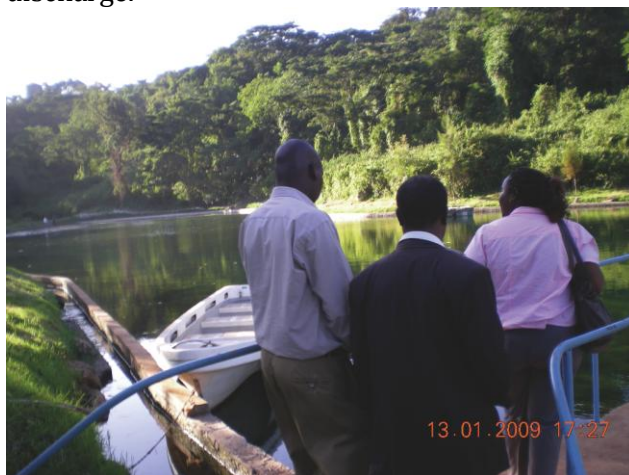
The regulations prohibit any action that directly or indirectly causes water pollution whether or not the water resource was polluted before the enactment of the Act. These include effluent from sewage treatment works, industry or other point sources. Annex 1 (First schedule) provides the set Standards that all domestic water sources are required to meet. Any effluent discharge into the environment may only be permissible with issuance of relevant effluent discharge license by the Authority.

In addition, the regulations prohibit water abstraction without EIA license from the Authority. It also provides buffer distances for cultivation near water sources of minimum six meter and a maximum of thirty meters from the highest ever recorded flood level. However, the Authority in consultation with the relevant lead agency may impose bans, restrictions or other measures on the use of any water source in order to prevent and control their degradation.

2.2 Water for Industrial Use And Effluent Discharge

The regulations prohibit use of water for trade or industrial undertaking unless the user complies with the standards established by the competent lead agency in regard to that particular activity.

Further the regulations requires that a license/permit be obtained before the discharge of any poison, toxic, noxious or obstructing matter, radioactive waste or other pollutants into the aquatic environment in order to minimize harm to fisheries, wildlife and recreational value. The prescribed standards are contained in annex 2 (third schedule). Local Authorities or individual persons that operate/own sewerage system are required to obtain an effluent discharge license as well as adhere to the monitoring guide for discharge.



Any operator/owner wishing to discharge into any existing sewerage system shall undertake the necessary pretreatment as per the requirements of the service provider. All persons licensed by the Authority for any effluent discharge are required to undertake regular monitoring and submit quarterly records. The Authority shall review the submitted monitoring records in order to verify compliance.

2.3 Water for Agricultural Use

The regulations disallow the use of wastewater for irrigation unless such water complies with the quality guidelines and standards set out in the regulations. A buffer zone of at least 50 meters wide shall be created between an irrigation scheme and the natural water body into which such irrigation scheme discharges its waters. Since inception the Authority and lead agencies have been undertaking inspections to ensure irrigation schemes established prior to the regulations comply.

2.4 Other Uses

The regulations stipulate that water for recreational uses meets the quality standards set out in the regulations.



3.0 OBLIGATIONS FOR DIFFERENT SECTORS

3.1 Hotels and Lodges sector

Tourism sector is heavily dependent on hotel industries for accommodation and other services to tourists. This leads to concentration of hotels and lodges in major tourists sites and destinations including coast region, National Parks and Game Reserves. Coastal region tourism accounts for 70% of the tourism industry. However hotel and lodges contribute to pollution of water system in the country due to inappropriate disposal of wastewater in form of grey (residual) water, sewage, organic and inorganic waste produced in the course of operations.

Contamination of water systems and soil by micro organisms may lead to health effects in human and animals. Increased biological oxygen demand (BOD) leads to suffocation of aquatic life reduced light penetration and aesthetic value as well as causing foul smell. It also degrades marine habitats, hence poor fish yields, impacting on the livelihood of the local communities. In addition, pollution threatens public health as it contaminates seafood and recreational areas.

Obligations

- The Second Schedule of EMCA 1999 requires that EIA be carried out for urban development including establishment of

new or expansion of recreational facilities. Existing facilities under the same schedule are required to undertake annual Environmental Audit for monitoring compliance to environmental management plan.

- Every Hotel facility that operate/own sewerage system is required to obtain an effluent discharge license from the Authority as well as adhere to set standards as set out in annex 2 (third Schedule) and the monitoring guide for discharge.
- Operators/owners of facilities that generate and discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

3.2 Sewerage Sector

Kenyan urban population has been growing at a rate of 8% per annum and is now more than 35% of the country's total population. The generation of solid, liquid and gas waste has been increasing at the same level due to changes in industrial development and consumption patterns. However the main sewer facilities have not been expanding at the same rate with increasing population and demand. Moreover there has never been any installation most of the urban areas and where the systems exist the coverage is low and often non-functional. In the absence of the systems some

developers have opted to use of septic tanks and soak pits as an alternative.



Poor management of effluent discharge has led to pollution of the environment by contaminating water bodies and aquifers. In addition soil pollution has also occurred causing adverse health effects to human and animals. Increased Biological Oxygen Demand (BOD) has caused eutrophication in water bodies leading to suffocation of aquatic life, reduced light penetration, foul smell and reduced aesthetic value. Effluent discharge may also contain intestinal worms such as round worms, hookworms, and amoebae thus posing health risks.

Obligations

- The Second Schedule of EMCA 1999 requires that EIA be carried out for urban development including establishment of new or expansion of recreational facilities. Existing facilities under the same schedule are required to undertake annual Environmental Audit for monitoring compliance to environmental management plan.

- Every operator/owner of sewerage system is required to obtain an effluent discharge license from the Authority as well as adhere to set standards as set out in annex 2 (third Schedule) and the monitoring guide for discharge.
- Operators/owners of sewerage system that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

3.3 Petroleum sector

Kenya's importation of oil comprises 30% refined and 70% crude. The crude oil is refined at Kenya Petroleum Refineries Ltd at Changanwe in Coast Province producing petroleum products. However, the distillation, processing and blending of crude oil results in the formation of petroleum residues in form of sludge and waste gas.

The petroleum by-products released into the environment undergo weathering processes, chemical oxidation and microbial degradation thus polluting the environment. Although weathering processes may not be detectable for years, inherent risks to human health and environment continue to manifest over time. Most petroleum based products have potential to cause cancer and the need to limit human exposure to the by-products. Although sludge is mainly used to process furnace oil, in Kenya there is no proper

handling of the sludge thus polluting the environment. It is therefore important to manage the risks to human health and prevent contamination to soil, water systems and air by ensuring adequate facilities to manage petroleum by-products.



Obligations

- The petroleum sector is required by EMCA 1999 to conduct an EIA for proposed new facilities or expansion as well as EA for existing ones.
- The water quality regulations prohibits one from discharging or applying any pollutants into the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).

3.4 Chemicals sector

There are diverse registered enterprises involved in chemical manufacturing utilizing both organic and inorganic chemicals for their operations. The industries utilize variety of chemicals and water for their operations leading to the discharge of chemical effluents as by-products. Although industries are expected to undertake pre-treatment of wastewater, this is often overlooked leading to direct discharge into the environment.

Untreated chemical effluents contaminate the environment through direct discharge, spillages or leakages from treatment plants as well as poor storage. As such, chemical pollution poses risk to water bodies such as rivers, dams, wells, springs, lakes, ocean and ground water. Chemical accumulation in plants and animals over time may lead to cancers or neurological disorders to human beings through ingestion. Other effects of chemicals to the environment include decolouration of water bodies and loss of aesthetic value.

Some of the common industries involved in chemical manufacturing/handling include: pesticides and fertilizers industries; soap and detergents; perfumes and cosmetics; toiletries industries; plastic industries; paints and varnishes; lacquers industries; printing and publishing as well as allied and battery manufacturers.



Obligations

- EMCA 1999 requires that EIA and environmental audit (EA) be carried out for processing and manufacturing industries including chemical works and processing plants.
- The water quality regulations prohibits one from discharging or applying any chemical pollutants into the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).
- Operators/owners of chemical the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).

- Operators/owners of chemical manufacturing industries that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

3.5 Flower farms and irrigation

The floriculture sector has become a major economic activity in Kenya contributing significantly to GDP and a leading foreign exchange earner. It has also contributed to employment opportunities. However, the sector is associated with high consumption of water, fertilizers and chemicals (pesticides and herbicides) for its production. This leads to discharge of chemical effluents into the environment thus causing pollution.

Most flower farms are located close to water bodies thus posing pollution risks through storm water drainage, seepage or direct discharge. Although some flower farms have constructed artificial wetlands for water pollution control, some are inadequate or poorly constructed thus causing pollution. Moreover not all flower farms adhere to the required regular water testing and analysis at the wetland entry and exit points.

Other large irrigation schemes producing food crop such as rice, maize and sugarcane also use large quantities of water and chemicals thus

discharging chemical effluents through surface runoff and seepage polluting the environment.

Untreated wastewater from flower farms and irrigations schemes posse health risks to human beings, livestock, wildlife and aquatic life. Chemicals such as pesticides and herbicides used in flower farms are adulterated with heavy metals such as mercury, cadmium, lead and other dissolved solids whichh are potential cancer causing agents. The wastewater may also contain intestinal worms such as round worms, hookworms, and amoebae.



Obligations

- EMCA 1999 requires that EIA and environmental audit (EA) be carried out

for large-scale agricultural activities including flower farms.

- The water quality regulations stipulate that any water for irrigation abstracted from a water body under environmental management plan for irrigational purposes should meet the set standards.
- Any owner or operator of an irrigation scheme including flower farms is required to create a buffer zone of at least 50 meters in width between the



- Any owner or operator of an irrigation scheme including flower farms is required to create a buffer zone of at least 50 meters in width between the irrigation scheme and the natural water body into which such irrigation scheme discharges its waters.
- All flower farms are required to obtain effluent discharge licenses from the Authority as well as adhere to set

standards as set out in annex 2 (Third Schedule) as well as the monitoring guide for discharge.

- Use of wastewater for irrigation is not permitted unless such water complies with the quality guidelines set out in these regulations.

3.6 Tanneries

There are various registered leather-tanning industries that process leather products. Most of these industries process raw hides to the wet blue stage for export. The process of converting rawhides or skins into leather require tanning agents. The mostly used tanning agents are trivalent chromium and vegetable tanning extracted from specific tree barks. Almost all leather made from lighter weight cattle hides and from the skin of sheep lambs goats and pigs is chrome tanned. Most tanneries have inefficient effluent pre-treatment plants with inadequate capacity to recover chrome and lime effluents.

Effluents from leather treatment plants and Tanneries pollute the environment through contamination to water, air and soil. Ammonia and sulphide emissions may occur during some wet processing steps such as delimiting and unhairing. Hydrogen sulphide gas released from tanneries causes bad smell around the environs of such facilities which has been a major cause of complaint from residents living near such

industries. Further, exposure of human beings to chromium salts for periods of 2 to 26 years has been reported to cause cancer of the digestive tract while in plants, high levels of chromium supply can inhibit seed germination and subsequent seedling growth.



Obligations

- EMCA 1999 requires that EIA and environmental audit (EA) be carried out for processing and manufacturing industries, chemical works, process plants

including tanning and dressing of hides and skins.

- The water quality regulations prohibits one from discharging or applying any pollutants into the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).
- Operators/owners of tanneries that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

3.7 Distillery sector

There are several registered enterprises involved in distilling, rectifying and blending of spirits in Kenya. Distillation involves the separation, selection and concentration of alcoholic products of yeast fermentation from the fermented grain mash. Some of these processes include distilling, rectifying, agrochemical processing, food processing and spirit blending generate significant volumes of effluent containing high BOD load. Ideally, distillery sector should embrace stabilization ponds for effluent treatment. However, most industries lack such infrastructure leading to the discharge of effluent to the environment causing pollution.

Effluent discharge from distillery facilities contain high BOD, Chemical Oxygen Demand (COD), Total

Suspended Solids (TDS/TSS), Sulphur Dioxide (SO₂), Volatile Organic Compounds (VOC) and solid wastes. The untreated effluents pollute the environment through contamination of water bodies through direct discharge, spillages or leakages. This is likely to result in growth of weeds, reduced aesthetic value of the environment, reduced light penetration and hence promote mortality rate of aquatic life.



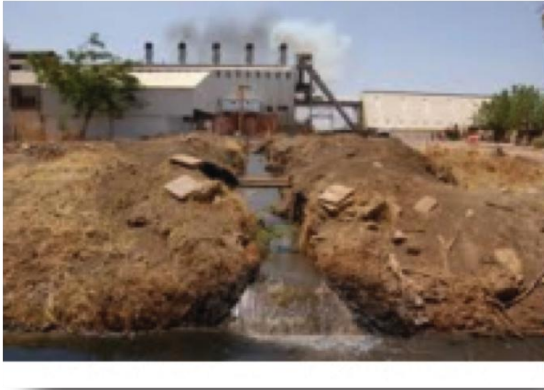
Obligations

- EMCA 1999 requires that EIA and environmental audit (EA) be carried out for processing and manufacturing industries including brewing and malting.

- The water quality regulations prohibits one from discharging or applying any pollutants into the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).
- Operators/owners of distillery plant that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity
- Operators/owners of distillery plant that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

3.8 Sugar and jaggeries

There are six sugar factories with annual production capacity of over 550,000 tonnes per annum in Kenya. The Western Kenya Jaggery, Agrochemical Food Corporation (Muhoroni) and Kisumu Molasses Plant produce alcohol from Molasses. Sugar factories consume large volumes of water resulting in discharge of huge quantities of effluents. The effluents are pre-treated through use of stabilization ponds before being discharged into the environment. However, some of the factories do not have efficient treatment systems thus discharging untreated effluents directly to the environment.



Obligations

- EMCA 1999 requires that EIA and environmental audit (EA) be carried out for processing and manufacturing industries, chemical works, process plants including sugar factories and jaggeries.
- The water quality regulations prohibits one from discharging or applying any pollutants into the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).
- Operators/owners of sugar factories and jaggeries that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

- Operators/owners of sugar factories and jaggeries are required to obtain an effluent discharge license from the Authority.

3.9 Slaughter Houses

Slaughterhouses, abattoirs, slaughter slabs and meat processing plants are important component in the livestock industry in Kenya. The Kenya meat Commission Plant is the largest of such facilities in the country alongside other privately owned slaughterhouses. These include Farmer's Choice Limited, Kenchic Limited and Dagoretti slaughterhouses and others spread across the country. Slaughterhouses utilize a lot of water for hygiene purposes such as cleaning leading to high quantity of effluent discharge. Ideally, slaughterhouses are required to treat their effluents onsite before discharge into the environment. However, this is not the case as most slaughterhouses lack effluent treatment facilities thus leading to direct discharge of untreated effluent into the environment.

Obligations

- EMCA 1999 requires that EIA and environmental audit (EA) be carried out for processing and manufacturing industries, chemical works, process plants including abattoirs and meat processing plants.
- Every person operating slaughterhouses, abattoirs and meat processing plants shall

apply for an effluent discharge license from the Authority.

- The water quality regulations prohibits one from discharging or applying any pollutants into the aquatic environment unless such pollutant complies with the standards set out in annex 2 (third Schedule).
- Operators/owners of abattoirs and meat processing plants that discharge effluents into the environment shall carry out daily effluent discharge quality and quantity monitoring and shall submit quarterly records of such monitoring to NEMA.

4.0 LICENSING PROCEDURES

- All applicants shall obtain relevant application forms from the nearest NEMA office or download the same from the NEMA Website: www.nema.go.ke
- Fill forms indicating EIA or EA Reference Number and attach supporting documents such as site location, maps, sketch of facility/site In relation to water body indicating three sampling points. In addition the applicant must attach design plan of the treatment works, effluent analysis from NEMA accredited laboratories, company PIN Certificate and Certificate of incorporation.
- The applicant shall pay the prescribed application fee equivalent to KShs 5,000 through NEMA's KCB Revenue Account 233971386. A NEMA official receipt will be issued to the applicant on evidence of payment such as bank deposit slips or copy of a banker's cheque.
- Applicant shall return the duly filled forms and documents to the District Environment Officer who will then forward the form to NEMA Headquarters for processing
- The application will then be reviewed within 21 working days and an approval for licensing will be given with relevant conditions or a decline stating the reasons
- Upon approval, a license fee is paid as per the sector as shown in annex 3 (Eleventh

Schedule) and a license issued within 30 working days

- The license is liable for renewal every year based on evidence of adherence to set conditions.



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