



**REPUBLIC OF LIBERIA**  
**ENVIRONMENT PROTECTION AGENCY**

SINKOR 4<sup>TH</sup> STREET, MONROVIA LIBERIA



**REGULATORY INSTRUMENT**  
**WATER QUALITY REGULATIONS OF LIBERIA**

REGULATORY INSTRUMENT No. RI/C&E/**NNN**/12-18



Consistent with THE ENVIRONMENT PROTECTION & MANAGEMENT LAW OF LIBERIA 2003, the Environmental protection Agency promulgates the



## **WATER QUALITY REGULATIONS OF LIBERIA, 2018**

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## **PART 1: PRELIMINARY**

### **SECTION 1: Citation**

These Regulations may be cited as the **Water Quality Regulations of Liberia, 2018** and shall come into force **60 days** after approval by the Board of Directors of the Environmental Protection Agency, Republic of Liberia.

### **SECTION 2: Objective**

The objective of these Regulations is to restore and maintain the chemical, physical, and biological integrity of the national waters of Liberia.

### **SECTION 3: Goals**

In order to achieve this objective it is hereby declared that, consistent with the provisions of the Agency's Act and these Regulations:

- I) The discharge of pollutants into the inland waters and navigable waters be prevented and abolished;
- II) In pursuant to these Regulations that Agency implements the provisions of the Act to achieve the goal of water quality which provides for the protection and propagation of human health, aquatic environment and wildlife, fish resources and all forms of biodiversity and provides for health recreation in and on the water;
- III) That the discharge of pollutants in toxic amounts be prohibited; and
- IV) That, consistent with the 'polluters pay principle', the polluter shall pay for the full costs of remedial measures in the event of water pollution;
- V) It is the national goal that all intakes and abstraction of water from water resources be controlled and properly managed to prevent pollution.

### **SECTION 4: Application of Regulations**

These Regulations shall apply to domestic water, water used for industrial purposes, water used for agricultural purposes, water used for recreational purposes, water for fisheries and wildlife, coastal waters that support the marine ecosystem and water used for any other purposes.

### **SECTION 5: Interpretation**

In these Regulations:

"Agency" means the Environmental Protection Agency, established under Section 4 of the Environment Protection Agency Act of 2003;

"Act" means the Environment Protection Agency Act of Liberia

"Lead Agency" means an Authority or other government Agency in charge of a zone that is defined and accorded standards and quality control in these Regulations and may be authorized by the Agency to act on its behalf;

"Ground water" means the water of underground streams, channels, artesian basins, reservoirs, lakes and other bodies of water in the ground, and includes water in interstices below the water table;

"Natural water body" means any river, stream, spring, lake, swamp, pond, estuary, coastal or other water source in a natural water course;

"Buffer Zone" means distinct or established areas that separate potentially competing users and that serves to lessen the danger of potential conflicts;

"pH" means the negative base 10 logarithm of the hydrogen ion concentration;

"Point Sources" means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, conduit, tunnel, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel or other floating craft from which pollutants are or may be discharged;

"Resource Quality" in relation to a water resource, means the quality of all the aspects of a water resource including:

- (a) the character and condition of the in-stream and riparian habitat;
- (b) the characteristics, condition and distribution of the aquatic biota;
- (c) the physical, chemical and biological characteristics of the water;
- (d) the quantity, pattern, timing, water level and assurance of in-stream flow; and
- (e) the water quality stipulated for the reserves.

## **PART II: CRITERIA & CLASSIFICATION OF WATER QUALITY**

### **SECTION 6: Classification of Quality of Waters**

1) The Agency may, in relation to any description of controlled waters (being a description applying to some or all of the waters of a particular class or two or more different classes), by regulation prescribe a system of classifying the quality of those waters according to criteria specified in the guidelines and standards to these Regulations.

2) In relation to these Regulations, the classification of the quality of a particular water is contained in the Schedules to these Regulations.

## **SECTION 7: Criteria for Classification of Water Quality**

1) The criteria specified in these Regulations in relation to any classification as prescribed in the First Schedule shall consist of one or more of the following:

- a) General requirements as to the purposes for which the waters to which the classification is applied are to be suitable;
- b) Specific requirements as to the substances that are to be present in or absent from the water and as to the concentrations of substances which are or are required to be present in the water;
- c) Specific requirements as to other characteristics of these waters;

2) And, for purposes of any such classifications and quality, these regulations and any other regulations relating to water resources, shall provide that the question whether prescribed requirements are satisfied may be determined by reference to such a sample of waters as may be prescribed.

## **PART III: GENERAL PROHIBITIONS**

### **SECTION 8: General Obligation of Every Person to Prevent Water Pollution**

1) Every person shall refrain from any act which directly or indirectly causes, or may cause immediate or subsequent water pollution, and it shall be immaterial whether or not the water resource was polluted before the activity of such person.

2) No person shall throw or cause to flow into or near a water resource any liquid, solid or gaseous substance or deposit any substance in or near it, as to cause pollution.

### **SECTION 9: Protection of Sources of Water- Lakes, Rivers, Streams, springs, Wells and other water Sources from Activities that may cause adverse Impact or Pollution without a License**

No person shall:

1) abstract spring water, ground water or carry out any activity near any lakes, rivers, streams, springs wells, and other water bodies (sources) that is likely to have adverse impact on the quantity and quality of the water, without an Environmental Impact Assessment license issued in accordance with the provisions of the Act and a license for water abstraction.

2) discharge any effluent from sewage treatment works, industry or other point sources into the aquatic environment without a valid effluent discharge license issued in accordance with the provisions of the Act.

#### **SECTION 10: Bans & Restrictions on Use of Water Sources**

The Agency may, in consultation with the relevant lead agency impose bans and restrictions and other measures on the use of sources of water for domestic purposes in order to prevent and control their degradation.

### **PART IV: WATER QUALITY STANDARDS**

#### **SECTION 11: Standards for Domestic Water**

All sources of water for domestic uses, including ground water, shall comply with the standards set out in the First Schedule of these Regulations.

#### **SECTION 12: Compliance with Water Quality Standards**

All operators and suppliers of treated water, containerized water and all water vendors shall comply with the relevant quality standards in force as promulgated by the Agency and relevant lead agencies (National Public Health Institute of Liberia, National Hydrological Survey, Liberia Water and Sewage Corporation, Ministry of Commerce, WASH Consortium etc).

#### **SECTION 13: Water Quality Monitoring**

The Agency shall in consultation with the relevant line ministries and/or agencies, maintain water quality monitoring records for sources of domestic water at least once every quarter and such monitoring records shall be in the prescribed form as set out in the Second Schedule to these Regulations.

### **PART V: WATER FOR INDUSTRIAL USE AND EFFLUENT DISCHARGE**

#### **SECTION 14: Water for Industrial Use and Compliance with Industrial Standards**

1) No person shall use water for trade or industrial undertaking unless the water complies with the standards established by the Agency in regard to that particular activity.

2) The Agency shall take measures to ensure compliance with the said standards by the owner or operator of the facility.

3) The Agency shall provide the standards to the industries periodically.

## **SECTION 15: Discharge of Industrial effluent into the Aquatic Environment**

No person shall discharge or apply any poisonous, toxic, noxious or obstructing matter, radioactive waste or other pollutants or permit any person to dump or discharge such matter from the Industrial undertaking into the aquatic environment unless such discharge, poisonous, toxic, noxious or obstructing matter, radioactive waste or pollutant complies with the standards set out in the Third Schedule and the relevant parameters specified in the Column of the Third Schedule on effluent discharge standards of industrial effluent.

## **SECTION 16: Compliance with Effluent Discharge License Standards & Guidelines**

Every City Corporation ,Town Council or any person operating a sewage system or owner or operator of any trade or industrial undertaking issued with an effluent discharge license as stipulated in these regulations shall comply with the conditions of License set out in the specific Schedule to these Regulations.

## **SECTION 17: Monitoring Guide for Discharge into the Sewerage Systems by Industrial Undertaking**

Every City Corporation, Town Council or person operating a sewage system or owner or operator of any trade or industrial undertaking shall be guided by the monitoring guide for discharge into the environment as set out in the Fourth Schedule to these Regulations or as the Agency may prescribe from time to time.

## **SECTION 18: Treatment of Effluent before Discharge into Public Sewers**

Every owner or operator of a trade or industrial undertaking or sewerage service provider issued with a license by the Agency to discharge effluent into any existing sewerage systems shall comply with the standards set out in the Schedules to these Regulations.

## **SECTION 19: Discharge Monitoring & Submission of Records**

- 1) Every person who generates and discharges effluent into the environment under a license issued under the Act shall carry out effluent discharge quality and quantity monitoring according to the methods and procedures of sampling and analysis prescribed by the Agency, and shall submit quarterly records of such monitoring to the Agency or its designated representative.
- 2) Such discharge monitoring record shall be in the prescribed form as set out in the Fifth Schedule to these Regulations.

## **SECTION 20: Review of Records**

The Agency shall review and monitor records in order to verify compliance with these Regulations.



## **PART VI: EFFLUENT DISCHARGE LICENSE**

### **SECTION 21: Application for Effluent Discharge License**

- 1) An application for an effluent discharge license under the Act shall be in the form provided in the Sixth Schedule to these Regulations.
- 2) The decision of the Agency together with the reasons thereof shall be communicated to the applicant within fifteen (15) working days from the date of submission of the duly completed application.
- 3) Where the Agency approves an application for an effluent discharge license it shall issue an effluent discharge license within fifteen (15) days and upon payment of the prescribed fees.

### **SECTION 22: License & License Fees**

- 1) Approved applications shall be subject to payment of the prescribed license fees as set out in Schedule to these Regulations.
- 2) Upon payment the Agency shall issue the License to the applicant.

### **SECTION 23: Variation, Cancellation or Forfeiture**

The Agency may, as it deems fit, vary, cancel and require an operator to forfeit the License pursuant to the powers of the Agency in the Act and these Regulations.

### **SECTION 24: License not Transferable**

An effluent discharge license issued under the Act shall not be transferred to another party.

## **PART VII: WATER FOR AGRICULTURAL USE**

### **SECTION 25: Prohibition of the use of Wastewater for Agricultural Purposes and transitional provision**

1. No person shall use wastewater for agricultural purposes unless such water is treated and complies with the quality guidelines set out under the Schedule to these Regulations.
2. All owners or operators of existing irrigation schemes shall within ninety days upon the coming into force of these Regulations take necessary steps to comply with these Regulations.

## **SECTION 26: Prevention of Abstraction from a Water Body under a Water Resources Management Plan**

Where the Agency has issued an order for the management of a natural water body, no person shall abstract water from such body for any purposes until such order is lifted.

## **SECTION 27: Data on Discharge of Effluents and creation of buffer**

1. All owners or operators of existing irrigation schemes shall submit data on effluent discharge and measures taken to comply with effluent discharge standards under these Regulations.
2. Any owner or operator of an irrigation scheme shall 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.

## **PART VIII: STANDARDS FOR COASTAL WATERS & MARINE WATERS**

### **SECTION 28: Marine Waters & Fisheries Zones & Pollution Control**

- 1) Water Quality Standards for coastal waters, fisheries, and marine waters shall be in accordance with the standards and criteria set out in the relevant Schedules to these Regulations.
- 2) The Agency in consultation with Lead Agencies in charge of maritime affairs, fisheries and marine zones shall adopt and implement pollution prevention and control measures and ensure compliance with the standards.

## **PART IX: WATER FOR ECOLOGICALLY SENSITIVE ZONES & WILDLIFE ZONES**

### **SECTION 29: Water for Wildlife & Ecologically Sensitive Zones**

- 1) Standards for wildlife zones water and ecologically sensitive zones shall be in accordance with the standards set out in the First Schedule to these Regulations
- 2) The Agency in consultation with Lead Agencies in charge of wildlife and ecologically sensitive zones shall take pollution prevention and control measures to ensure compliance with the standards.

### **SECTION 30: Prevention of Discharge Into waters around Wildlife and Ecologically Sensitive Zones**

No person shall discharge or apply any poison, toxic, noxious or obstructing matter, radioactive wastes, or other pollutants or permit any person to dump or discharge any such matter into water meant for fisheries, wildlife, or any other uses within the Coastal Areas, Fisheries and Wildlife Zones.

## **SECTION 31: Water for Contact Water Sports & Recreational Uses**

No person shall use or allow to be used any natural water body for contact water sports and recreational purposes unless the water body meets the quality standards for contact water sports and recreation as set out in the Ninth Schedule to these Regulations.

## **PART X: GENERAL COMPLIANCE & ENFORCEMENT**

### **SECTION 32: Water Quality Monitoring & Compliance Mechanism**

Pursuant to the powers vested in the Environment Inspector under the Act, an Environment Inspector may inspect and sample any discharge points and sources of water pollution.

### **SECTION 33: Water Quality Sampling**

Water Quality sampling procedures shall be in accordance with the Ninth Schedule of these Regulations

### **SECTION 34: Offences & Penalties Relating to Water Quality Standards**

- 1) Any person who contravenes any of these Regulations commits an offence and shall be liable on conviction to penalties provided for under the Act.
- 2) In addition to the above, the Environmental court shall give an environmental restoration order, compensation as applicable and such other orders and penalties as provided for in the Act.

### **SECTION 35: Analytical Laboratories**

The Agency shall designate Analytical laboratories and equipment for water quality sampling pursuant to these Regulations.

## **PART XI: MISCELLANEOUS PROVISIONS**

### **SECTION 36: Inventory of Water Bodies**

Within two (2) years from the date of commencement of these Regulations, the Agency shall prepare and maintain an inventory of all natural water bodies and take measures including the development of environmental management plans, to prevent and control degradation of such sources.

### **SECTION 37: OFFENCES**

Any person who contravenes any of these Regulations commits an offence and shall be liable on conviction to a fine not exceeding five thousand United States dollars or as applicable under the Environmental Protection and Management Law of Liberia

## **SECTION 38: FEES AND PARAMETERD OF CONCERN**

1. All applications and licenses shall be accompanied by the prescribed fees as set out in the Tenth Schedule to these Regulations.
2. The Agency shall provide a list of parameters of concern to proponents with discharge licenses

## SCHEDULES

### **FIRST SCHEDULE: Water Quality Standards for sources of domestic use**

<b>Parameter (Unit)</b>	<b>Max. Allowable Limit</b>
pH	6.5 -8.5
Sodium (mg/L)	20
Total Dissolved Solids (mg/L)	1000
Total alkalinity as CaCO <sub>3</sub> (mg/L)	400
Nitrate (mg/L)	45
Sulfate (mg/L)	250
Chloride (mg/L)	250
Hardness (mg/L)	150
Nitrate-Nitrogen (mg/L)	10
Nitrite (mg/L)	3.0
Nickel (mg/L)	0.1
Arsenic (mg/L)	0.01
Selenium (mg/L)	0.05
Chromium total (mg/L)	0.10
Fluoride (mg/L)	2.0
Copper	1.0
Mercury	0.002
Free cyanide	Nil
Barium	2.0
Cadmium	0.005
Lead	0.01
Beryllium	0.004
Zinc	2.0
Manganese	0.05
Iron	0.3
Phosphorus	5
Ammonia	0.5
Aluminum	0.2
Chromium Hexavalent	0.1
Magnesium	30
Calcium	75
Arsenic	0.01
Total suspended solids	30
E.Coli	Nil/100ml
Phenols	Nil
Permanganate value	1.0

Nil means less than limit of detection using prescribed sampling and analytical methods and equipment as determined by the Agency.

**And any other parameters as may be prescribed by the Agency from time to time**

## SECOND SCHEDULE: Water Quality Monitoring For Sources of Domestic Water

Name of Water Source.....  
 Sample No.....  
 Date and Time of Sampling.....  
 Description of sample.....  
 Date and time sample received in lab.....  
 Date and time sample was examined.....

	RESULTS	
Parameter (Unit)	Observed value	Max. Allowable Limit

**All parameters tested/monitored shall be reported in this form. Parameters not accounted for the first Schedule but required to be monitored under specific projects shall be provided by the Agency**

Remarks

.....  
 .....  
 .....  
 .....  
 .....  
 .....

**THIRD SCHEDULE Part A: Standards for Effluents discharged into the Environment (applicable to all proponents except mining companies)**

<b>Parameter (Unit)</b>	<b>Max. Allowable limits</b>
Alkyl Mercury compounds (mg/L)	ND
Arsenic (mg/L)	0.02
Arsenic and its compounds (mg/L)	0.1
Benzene (mg/L)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 °C) (mg/L)	50
Boron (mg/L)	1.0
Cadmium (mg/L)	0.01
Sulfate (mg/L)	250
Chemical Oxygen Demand (COD (mg/l)	100
Chromium VI (mg/L)	0.05
Chloride (mg/L)	250
Chlorine free residual (mg/L)	0.1
Chromium total (mg/L)	2.0
Copper (mg/L)	1.0
Dissolved iron (mg/L)	10
Dissolved Manganese (mg/L)	10
E. Coli (counts/100ml)	Nil
Fluoride (mg/l)	2.0
Lead (mg/L)	0.01
n-Hexane extracts (animal and vegetable fats) (mg/L)	30
n-Hexane extracts (mineral oil) (mg/L)	5.0
Oil and Grease	Nil
Polychlorinated biphenyls, PCBs (mg/L)	Nil
pH ( Hydrogen ion activity----marine) (mg/L)	5.0 -9.0
pH ( Hydrogen ion activity----non-marine) (mg/L)	6.5 -8.5
Phenols (mg/L)	0.001
Selenium (mg/L)	0.01
Sulfide (mg/L)	0.1
Total Suspended Solids	30
Temperature (in degrees Celsius) based on ambient temperature	±3
Total Coliform (counts/100ml)	30
Total cyanide(mg/L)	0.5
Free cyanide (mg/L)	ND
Total Nickel (mg/L)	0.3
Total Dissolved Solids (mg/L)	1000
Color in Hazen Unit (H.U)	15
Detergents	Nil
Phosphate	5.0
Total nitrogen	10
Ammonia	0.4

Not detectable (nd) means that the pollution status is below the detectable level by the measurement methods established by the Agency. The Agency may add parameters from time to time as necessary

**THIRD SCHEDULE Part B: Standards for Effluents discharged into the Environment (applicable to mining companies)**

<b>Parameter (Unit)</b>	<b>Max. Allowable limits</b>
Arsenic (mg/L)	0.05
Arsenic and its compounds (mg/L)	0.1
Biochemical Oxygen Demand (BOD 5days at 20 °C) (mg/L)	250
Boron (mg/L)	1.0
Cadmium (mg/L)	0.01
Sulfate (mg/L)	250
Chemical Oxygen Demand (COD (mg/l)	500
Chromium VI (mg/L)	0.05
Chloride (mg/L)	250
Chlorine free residual (mg/L)	0.1
Chromium total (mg/L)	2.0
Copper (mg/L)	1.0
Dissolved iron (mg/L)	10
Dissolved Manganese (mg/L)	10
Dissolved Oxygen	≥ 5.0
Fluoride (mg/l)	2.0
Lead (mg/L)	0.01
Oil and Grease	Nil
pH ( Hydrogen ion activity----marine) (mg/L)	5.0 -9.0
pH ( Hydrogen ion activity----non-marine) (mg/L)	6.5 -8.5
Selenium (mg/L)	0.01
Sulfide (mg/L)	0.1
Total Suspended Solids	30
Temperature (in degrees Celsius) based on ambient temperature	±3
Total cyanide(mg/L)	1.0
Free cyanide (mg/L)	0.02
WAD Cyanide	0.5
Total Nickel (mg/L)	0.3
Total Dissolved Solids (mg/L)	1000
Color in Hazen Unit (H.U)	15
Phosphate	5.0
Total nitrogen	10
Ammonia	0.4



#### FOURTH SCHEDULE: STANDARDS FOR EFFLUENT DISCHARGE INTO PUBLIC SEWERS

Parameter (Unit)	Max. Allowable limits
Suspended solids (mg/L)	250
Total dissolved solids (mg/L)	2000
Temperature °C	20- 35
pH	6-9
Oil and Grease (mg/L) -where conventional treatment shall be used	10
Oil and Grease (mg/L)- where ponds is a final treatment method	5
Ammonia Nitrogen (mg/L)	20
Biological Oxygen Demand BOD5days at 20 °C (mg/L)	500
Chemical Oxygen Demand COD (mg/L)	1000
Arsenic (mg/L)	0.02
Mercury (mg/L)	0.05
Lead (mg/L)	1.0
Cadmium (mg/L)	0.5
Chromium VI (mg/L)	0.05
Chromium (Total) (mg/L)	2.0
Copper (mg/L)	1.0
Zinc (mg/L)	5.0
Selenium (mg/L)	0.2
Nickel (mg/L)	3.0
Nitrates (mg/L)	20
Phosphates (mg/L)	30
Cyanide Total (mg/L)	2
Sulfide (mg/L)	2
Phenols (mg/L)	10
Detergents (mg/L)	15
Color (H.U)	<40
Free and saline Ammonia as N (mg/L)	4.0
Inflammable solvents	Nil
Radioactive residues	Nil

**And any other parameter as the Agency may prescribe**

#### FIFTH SCHEDULE: Monitoring For Discharge of Treated Effluent into the Environment

Lead Agency: .....

Name of organization.....  
 Nature of work.....  
 Sample No.....  
 Date and Time of Sampling .....  
 Average flow rate (m<sup>3</sup>/day).....  
 Description of sample.....  
 Date and time sample received in lab.....  
 Date and time sample was examined.....

Parameter	RESULTS				Remarks
	Sample upstream	Sample at discharge point	Sample down stream	Guideline value	

**All parameters selected shall be reported in this form. The choice of parameters shall be based on the nature of activities carried out by the proponent. Parameters of concern shall be provided by the Agency**

**SIXTH SCHEDULE**  
**FORM A: APPLICATION FOR EFFLUENT DISCHARGE INTO AQUATIC ENVIRONMENT**

## **PART A: DETAILS OF APPLICANT**

A1. Name of applicant:

.....

A2. Personal Identification Number .....

A3. Address: .....

A4. Name of contact person: .....

A5. Telephone No: .....

A6. E-mail.....

A7. Previous License Number (optional for renewal) .....

## **PART B: DETAILS OF DISCHARGING FACILITY**

B1. Location of discharging facility: .....

B2. Activity of discharging facility.....

B3. Nature and composition of effluent: .....

B4. Does the facility have effluent treatment plant (Yes or No).....

B5. Maximum quantity of effluent which is proposed to discharge on any one day (in M<sup>3</sup>/day) .....

B6. The highest rate at which it proposes to discharge the effluent (in M<sup>3</sup>/hr.) .....

B7. Source of processing water to the facility.....

B8. Does the facility have access to a Laboratory for monitoring the quality of discharged effluent? (Yes or No) .....

B9. Description of the activities of the facility .....

B10. Point of discharge: .....

## **PART C: DECLARATION BY APPLICANT**

I hereby certify that the information given above is correct and true to the best of my knowledge:

.....  
Signature of Application

.....  
Full Names in Block letters

.....  
Position

On behalf of: .....  
(Firm name and seal)

Date: .....

**PART D: FOR OFFICIAL USE**

Approved/Not Approved.....

**COMMENTS**

.....  
.....

Official Signature.....

Date.....

Important Notes: Please submit the following: (a) Application form in triplicate and (b) copy of payment slip for issuance of official receipt

**Form B: EFFLUENT DISCHARGE LICENCE**

Application Reference No: .....

License No. ....

**FOR OFFICIAL USE**

This is to certify that the application for discharge to aquatic Environment received from

..... (name of applicant) of .....

...(address) to the

Environment Protection Agency in accordance with Water Quality Regulations of Liberia for

..... (facility) located at ..... (address) to

discharge effluent to ..... has been evaluated and a license is hereby issued for discharge, subject to the attached conditions.

Dated this ..... day

of..... 20..

Signature: .....

(Official Stamp)

Executive Director/C.E.O

Environmental Protection Agency, Liberia

**Conditions of License**

1. This License is valid for a period of ..... from the date hereof.

2. Frequency of Monitoring (Daily/Weekly/Monthly/Quarterly) .....

**FORM C: REGISTER FOR EFFLUENT DISCHARGE LICENCE INTO THE ENVIRONMENT**

<b>Name of discharging facility</b>	<b>Location</b>	<b>License No.</b>	<b>Date Issued</b>	<b>Expiry Date</b>	<b>Condition of License</b>	<b>Discharging into</b>	<b>Remarks/Status</b>

### **Status of License**

1. New
2. Cancelled
3. Variation

## **SEVENTH SCHEDULE**

### Microbiological quality guidelines for wastewater used in irrigation

Reuse conditions	Exposed group	Intestinal nematodes (MPN/L)*	Coliform (MPN/100ml)**
Unrestricted irrigation ( crops likely to be eaten uncooked, sports fields, public parks)	Workers, consumers, public	<1	<1000
Restricted irrigation (cereal crops, industrial crops, fodder crops, pasture and trees***	Workers	<1	No recommended standards

\**Ascaris lumbricoides*, *Trichuris trichiura* and human hookworms.

\*\* A more stringent guideline (<200 coliform group of bacteria per 100 ml) is appropriate for public lawns, such as hotel lawns, with which the public may come into direct contact.

\*\*\* In the case of fruit trees, irrigation should cease two weeks before fruit is picked and fruit should be picked off the ground. Overhead irrigation should not be used.

## EIGHT SCHEDULE

## STANDARDS FOR IRRIGATION WATER

Parameter	Permissible Level (Unit)
pH	6.5-8.5
Aluminum	5 (mg/L)
Arsenic	0.1 (mg/L)
Boron	0.1 (mg/L)
Cadmium	0.5 (mg/L)
Chloride	0.01 (mg/L)
Chromium	1.5 (mg/L)
Cobalt	0.1 (mg/L)
Copper	0.05 (mg/L)
E.coli	Nil/100 ml
Fluoride	1.0 (mg/L)
Iron	1 (mg/L)
Lead	5 (mg/L)
Selenium	0.19 (mg/L)
Sodium Absorption Ratio (SAR)	6 (mg/L)
Total Dissolved Solids	1200 (mg/L)
Zinc	2 (mg/L)

**And any other parameters as may be prescribed by the Agency from time to time**

## NINTH SCHEDULE



## QUALITY STANDARDS FOR RECREATIONAL WATERS

Parameter	Permissible Level (Unit)
Fecal coliform (Counts/100 ml)	Nil
Total coliform (Counts/100 ml)	500
Arsenic (mg/L)	0.05
Color (True Color Units)	100
Cadmium	0.01
Chromium	0.1
Light Penetration (meters)	1.2
Mercury (mg/L)	0.001
Odor (Threshold Odor Number, TON)	16
Oil and Grease (mg/L)	5
pH	6 – 9
Radiation, Total (Bq/L)	0.37
Surfactant, MBAs (mg/L)	2
Temperature ( <sup>0</sup> C)	30
Turbidity (NTU)	50

**And any other parameters as may be prescribed by the Agency from time to time**

## TENTH SCHEDULE

## **FEES**

**The fees chargeable under these Regulations shall be as specified hereafter.**

<b>Description</b>	<b>Fees (USD)</b>
Application for discharge of effluent into the Environment	
Annual License fee for discharge of effluent into the environment	
Variation of effluent discharge License	

## **Binding Force**

These Regulations shall be binding in its entirety and directly applicable to all aspects of Water Quality Control and Management in Liberia.

Done on this \_\_\_\_ of December, A.D. 2018, in the city of Monrovia, County of Montserrado, Republic of Liberia;

Approved:

\_\_\_\_\_  
**Nathaniel T. Blama Sr.**  
**Executor Director/CEO**  
**ENVIRONMENT PROTECTION AGENCY**