

*Extraordinary*



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# NATIONAL ENVIRONMENTAL (SURFACE AND GROUNDWATER QUALITY CONTROL) REGULATIONS, 2011



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S. I. 22 of 2011

## NATIONAL ENVIRONMENTAL (SURFACE AND GROUND WATER QUALITY CONTROL) REGULATIONS, 2011

In exercise of the powers conferred on me by Section 34 of the National Environmental Standards and Regulations Enforcement Agency (Establishment) Act 2007 and all other powers enabling me in that behalf, I, Mr JOHN OKEV, Honourable Minister, the Ministry of Environment hereby make the following Regulations :

[28th Day of April, 2011]

Commence-  
ment.

### PART A—SURFACE WATER QUALITY CONTROL

1. The purpose of these Regulations is to restore, enhance and preserve the physical, chemical and biological integrity of the nation's surface waters, and to maintain existing water uses. The standards contained herein provide for the protection of surface waters from pollutants so that the waters shall be protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors :

Purpose.

(a) citizens' right of access to clean water and sanitation ;

(b) protection of the water environment for sustainability of the resources and protection of aquatic ecosystems ; and

(c) reduction and prevention of pollution and degradation of surface water resources and recognition of the preventive, precautionary and polluter-pays-principles.

2. These Regulations shall apply to all surface waters of Nigeria including local and trans-boundary waters.

Application.

3. The quality of surface waters shall be maintained in a safe and satisfactory condition for the following uses :

Water Uses  
to be  
Protected.

(a) agricultural, industrial, and public water supplies after reasonable treatment, except where natural salinity precludes such uses ;

(b) wildlife, fish and other aquatic life ;

(c) recreation ;

(d) navigation ;

(e) controlled and regulated waste assimilation to the extent that such use is compatible with other uses ;

(f) hydro-energy ; and

(g) such other uses as may be provided by these Regulations.

4. The following minimum criteria are applicable to all Surface waters of the nation :

General  
Provisions  
for Surface  
waters.

(a) At a minimum, all waters including mixing zones shall be free of pollutants in concentrations or combinations or from anthropogenic activities, subject to these Regulations, that :

(i) adversely affect the composition of fish and wildlife ;

(ii) adversely affect the physical, chemical, or biological integrity of the environment ;

(iii) adversely alter the life cycle functions, uses, processes and activities of fish and wildlife ; or

(iv) adversely affect human health.

(b) *Aesthetics* : All waters including mixing zones shall be free from pollutants in concentrations or combinations that :

(i) settle to form deposits that are unsightly, putrescent, or odorous to such a degree as to create a nuisance, or interfere with the existing or designated uses ;

(ii) float as debris, oil, grease, scum or other floating materials attributable to wastes in amounts, to such a degree as to create a nuisance or interfere with the existing or designated uses ;

(iii) produce odour or taste or change the colour or physical, chemical or biological conditions to such a degree as to create a nuisance or interfere with the existing or designated uses ; or,

(iv) result in the dominance of species of fish and wildlife to such a degree as to create a nuisance or interfere with the existing or designated uses.

(c) *Radioactive Substances* : The level of radioactive materials in all waters shall not be in concentrations or combinations which will likely be harmful to humans, aquatic life and wildlife, or result in concentrations in organisms producing undesirable conditions in line with extant national regulations.

(d) *Nutrients* : Nutrients shall not exceed the limitations specified in regulation 5 of these Regulations and/or more stringent site-specific limits necessary to prevent or minimize accelerated or cultural eutrophication.

(e) *Thermal Mixing Zones* : Thermal discharges into tidal rivers, fresh water, streams or estuaries, where thermal mixing zones are allowed by the Agency, the mixing zone will be limited to not more than one quarter (1/4) of the cross sectional area and/or volume of river flow, stream or estuary, leaving at least three quarters (3/4) free as a zone of passage. In wide estuaries and oceans, the limits of mixing zones will be established by the Agency.

(f) *Non-thermal Mixing Zones* : For non-thermal discharges, the Agency may recognize, where appropriate, a limited acute and/or chronic mixing



zone(s) on a case-by-case basis. The locations, size and shape of these zones shall provide for the maximum protection of fish and wildlife.

(g) *Baseline for Mixing Zones* : At a minimum, all mixing zones must :

(i) meet the criteria for aesthetics as contained in (b) of this regulation ;  
 (ii) be limited to an area or volume that will prevent interference with the existing and designated uses in the associated water body segment and beyond ;

(iii) allow an appropriate zone of passage for migrating fish and other organisms, prohibit lethality to organisms passing through the mixing zone, and protect the spawning and nursery habitat ;

(iv) not allow substances to accumulate in sediments, fish and wildlife or food chains such that known or predicted safe exposure levels for the health of humans or fish and wildlife will be exceeded ; and

(v) not be used for, or considered as a substitute for minimum treatment technology required by the Agency.

(vi) *Stream Flow Conditions* : For activities that will likely cause or contribute to flow alterations, stream flow conditions must be adequate to support existing and designated uses.

5.—(1) *Physico-chemical Criteria*—(a) *Temperature* : Except in designated thermal mixing zones, temperature increase by a 7-Day Average of the Daily Maximum temperatures (7-DADMax) of surface waters shall not be more than 0.3°C above natural background conditions.

Water  
Quality  
Standards

(b) *Dissolved Oxygen (DO)* : Dissolved oxygen content of surface waters shall not be less than the values indicated in Schedule I to these Regulations.

(c) *Colour and Turbidity* : Colour and turbidity shall not exceed 10 NTU over natural background conditions.

(d) *Taste and Odour* : Taste and odour shall be none other than that of natural origin and none associated with nuisance algal species or, cause taste or odour in portions of fish.

(e) *pH (Standard Units)* : pH shall be in the range indicated in Schedule I to these Regulations.

(f) *Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD)* :—BOD and COD shall not be less than the limits indicated in Schedule I to these Regulations.

(g) *Suspended Solids* : Suspended solids shall not exceed limits indicated in Schedule I to these Regulations.

## (2) Biological Criteria.

(a) *Coliform Count (lactose positive)*—Coliform count shall not exceed the values indicated in Schedule III to these Regulations.

(b) *Coliphages*—Coliphages shall not exceed the values indicated in Schedule III to these Regulations.

(c) *Parasites*—Pathogenic intestinal protozoa and non-intestinal protozoa in all of their phases must not be detected.

(3) *Toxic Substances*—Toxic substances shall not be introduced above natural background levels, in any surface waters of the nation.

(4) *Chemical constituents*—Chemical constituents shall not be in such concentrations that would exceed the Chemical Ambient Water Quality Criteria as found in Schedule II to these Regulations.

(5) *Nutrients*—Average Total Phosphorus :

(a) shall not exceed 0.025 mg/l in any lake, pond, river, stream, or reservoir. Average total phosphorus in tributaries at the point where they enter such bodies of water shall not cause an increase in this phosphorus level, except as naturally occurs, unless the Agency determines, on a site-specific basis, that a different value for phosphorus is necessary to prevent cultural eutrophication or growth of undesirable or nuisance species.

(b) shall not exceed the criterion of sub-regulation (5)(a) of this regulation in a downstream lake, pond, river, stream or reservoir. Discharges containing phosphates will not be permitted upstream of lakes, rivers, streams, ponds or dams and Phosphates shall be removed from discharges to the extent that the concentration does not exceed the limit indicated in Schedule II to these Regulations.

(6) *radioactive Substances*—Radioactive substances shall be within the limits indicated in Schedule II to these Regulations.

6. A person shall not discharge pollutants into any waters of the nation or perform any activities alone or in combination which the Agency determines will likely result in the violation of any of these water quality criteria or interfere with one or more of the existing or designated uses assigned to the receiving waters or to downstream waters in accordance with regulations 4 and 5 of these Regulations.

7. A person shall not discharge pollutants into any waters of the nation, or perform any activities alone or in combination which the Agency determines will likely result in further degradation of water quality of the receiving waters or downstream waters which are already below the water quality standard.

Activities in  
Violation of  
Water  
Quality  
Standards.

Activities in  
further  
degradation  
of low  
quality  
waters.



8. A person shall not discharge pollutants into any waters of the nation, or perform any activities which the Agency determines will likely result in violation of the provisions of these Regulations.

Anti-degradation  
Activities .

9. Any release into a mixing zone shall not cause a loss of habitat or species, or impair any approved use.

Mixing  
Zones.

10. New discharges into surface waters of the nation shall be allowed, provided the discharge will not impair existing uses nor attainment of designated uses and will comply with other provisions of these Regulations including all required approvals, and also comply with the following restrictions :

Restrictions  
to New  
Discharges.

(a) New discharge into the terminal reservoir of a public drinking water supply is prohibited with the exception of discharges of storm-water drainage. New discharges into all other waters of the public drinking water supply shall be prohibited with the exception of the types listed in paragraphs (b) (i) to (xii) of this regulation..

(b) New discharges into waters that are not public drinking water supplies may include :

(i) discharge of storm-water ;

(ii) discharges from industrial non-contact cooling water ;

(iii) discharges from construction site dewatering provided that the applicant has demonstrated to the satisfaction of the Agency that no reasonable alternatives exist ;

(iv) discharges from groundwater remediation projects provided that the applicant has demonstrated to the satisfaction of the Agency that no reasonable alternatives exist ;

(v) discharges from aquaculture facilities as appropriately authorized by all required state and federal agencies ;

(vi) discharges from water main maintenance such as main flushing and cleaning operations ;

(vii) discharges of dredged material ;

(viii) discharges from farming activities into surface waters which are hydrographically disconnected from all other surface waters as approved by the Agency ;

(ix) placement of suitable solid materials in appropriate amounts for the purpose of the formation of an artificial reef as approved by the Agency ;

(x) discharges from aquatic research related activities provided that the applicant has demonstrated to the satisfaction of the Agency that no reasonable alternatives exist ;



(xi) discharges from desalination facilities into seawaters ; and

(xii) other new discharges provided the applicant demonstrates to the satisfaction of the Agency that :

(A) the discharge serves a compelling public purpose which provides benefits to the public as a whole as opposed to individual or private interests ;

(B) there is no reasonable alternative means of, or location for, serving the compelling public purpose cited ; and

(C) the discharge will not impair existing uses nor attainment of designated uses.

11. A person shall not carry out any activity in, or discharge pollutants into, any surface waters of the nation that has effluent limited or water quality limited part unless the discharge complies with any additional effluent limitations and receives any additional treatment/pretreatment which the Agency determines is necessary to comply with these Regulations.

12.—(1) For waters identified as water quality limited, the Agency shall identify those pollutants within discharges to the water quality limited waters which do or have the reasonable potential to cause or contribute to a violation of regulations 4 and 5 of these Regulations and the Agency shall develop a Total Maximum Daily Load (TMDL) for each of these pollutants.

(2) The TMDL shall determine the maximum amount of the pollutant that can be discharged into the water quality limited waters and be in compliance with regulation 5 of these Regulations.

(3) The TMDL shall be based on best available scientific information and allocation of the TMDL may be based on, but not limited to, technical feasibility of pollutant removal, the relative costs of treatment to the contributing discharges, and the relative contribution from each source.

(4) The Agency shall not be required to allocate the full amount of the pollutant specified in regulation 5 of these Regulations but may designate a portion of the allocation as a reserve or margin of safety as deemed necessary.

13. The prohibitions enumerated in this regulation shall apply to all pollutants, regardless of the effect on water quality standards or the treatment which the pollutants received.

(1) *Pollutants*—A person shall not discharge or engage in activities that introduce pollutants into the waters of the nation except as in compliance with the provisions of these Regulations and pursuant to the terms and conditions of an approval issued by the Agency.

(2) *Urban Runoff*—A person shall not discharge storm water, gutter runoff, sump discharges, or street runoff to a treatment works designed to receive only wastewater.

Effluent  
Limited and  
Water  
Quality  
Limited  
Waters.

Total  
Maximum  
Daily Load  
in Water  
Quality  
Limited  
Waters.

Prohibited  
Discharges.

(3) *Hazardous Waste and Hazardous Substances*—A person shall not discharge hazardous wastes or hazardous substances into any surface waters of the nation, except as in compliance with the provisions of these Regulations and other applicable laws, and in accordance with the terms and conditions of an approval issued by the Agency.

(4) *Oil, Petroleum Products, Solvents*—A person shall not discharge oil or petroleum products into the waters of the nation except as in compliance with the provisions of these Regulations and other applicable Regulations of the Agency, and in accordance with the terms and conditions of an approval issued by the Agency there-under.

(5) *Discharges of Sewage from Vessels*—

(a) a person shall not discharge any sewage from a vessel into the waters of the nation ;

(b) a person shall not operate or moor in the waters of the nation a vessel equipped with a marine toilet that is :

(i) not a type approved by the Agency and relevant authorities ;

(ii) an approved type that is not in proper working condition ; or

(iii) not having the vessel's marine toilets properly sealed to prevent overboard discharges by one of the following means : the through-hull fitting is plugged; or the Y-valve is secured to the holding tank position by means of a padlock, wire tie, or by removing the seacock handle. All sewage must be discharged into an approved marina pump-out facility.

14.—(1) A person shall not release any substance into, or conduct any activity which will likely cause or contribute to pollution or adversely affect species of, the waters of the nation; without having obtained all required approvals and permits from the Agency.

Approvals  
and Permits  
Required for  
Regulated  
Activities.

(2) For the purpose of sub-regulating (1) of this regulation, such activities shall include but not limited to :

(a) discharge of wastewater ;

(b) discharge of pollutants ;

(c) dredging of surface water ;

(d) dredging and dredged material disposal ;

(e) filling of surface waters of the nation ;

(f) construction activities ;

(g) mining activities ;

(h) any commercial, industrial, state or municipal land development that results in the creation of 3700m<sup>2</sup> or more of additional impervious area ;



- (i) two hectares (five acres) or more of land disturbance ;
- (j) marinas - construction of new facilities or expansion of existing facilities ;
- (k) flow alterations ;
- (l) harbor management plans for those elements which will likely affect water quality ;
- (m) a point source discharge of pollutants ; or
- (n) any other activity that may produce a measurable change in a water body.

(3) Where any project or activity mentioned in sub-regulation (2) of this regulation or requires a permit or approval by any other authority, the approval or permit shall be obtained before commencement of the project.

(4) Existing facilities shall obtain permit for regulated activities within six months of the commencement of these Regulations.

Application  
for Permit.

15.—(1) Applications for permits shall be submitted and processed in accordance with the National Environmental (Permitting and Licensing System) Regulations, 2009 and shall contain such documentation and/or information as the Agency may require, including but not limited to :

- (a) hydrology of the area ;
- (b) type of discharge, the concentration and quantity ;
- (c) timetable for and duration of the proposed construction or other activities ;
- (d) any additional information as may be deemed necessary by the Agency to fully assess the impact of the proposed activity upon the waters of the nation or to support any changes in the scope of the project, actual or anticipated ;
- (e) comprehensive engineering report and detailed engineering plans and specifications for the proposed project ;
- (f) any additional information including proprietary data, where, in the opinion of the Agency, such information is necessary to fully disclose all relevant facts concerning the application for an approval. The applicant may assert a claim of confidentiality for proprietary data provided the said information is clearly marked and segregated within the total information requested by the Agency ; and
- (g)—(i) a preponderance of clear and scientifically valid evidence having a probative value demonstrating to the satisfaction of the Agency, that the activity will not violate the surface water quality standards established by these Regulations ; and

(ii) professional Certification for plans and specifications for all engineering works required under sub-regulation (2) of regulation 14 of these Regulations shall be certified by a registered professional body in engineering and/or hydrogeology.

(2) Failure of the applicant to submit information deemed necessary by the Agency in order to fully assess the impact of the proposed project on waters of the nation or to support any changes in the scope of the proposed project, actual or anticipated, shall constitute valid cause for denial of the application.

(3) *Modifications* : The Agency may approve modifications to an approved project or activity without further notice, provided that the project had been noticed in accordance with these Regulations, and such modifications are minor in nature and will have little or no adverse environmental impact.

(4) In granting an approval, the Agency shall have regard for :

(a) the use and demonstration of innovative pollution control, and management approaches that would allow a significant improvement in best management practices for a particular industry or category of actions ;

(b) the economic and social benefits of the activity(ies) ;

(c) the prevention or remediation of environmental or public health threats ;

(d) the preservation of assimilative capacity for future industry and development ; and

(e) information that identifies and selects the best combination of site, structural and managerial approaches that can be feasibly implemented to prevent or minimize the lowering of water quality.

**16.—(1)** The issuance of an approval mandates compliance with all terms, conditions, management practices and operations and maintenance requirements set forth in the approval.

Obligations  
of a Permit  
Holder.

(2) The issuance of an approval does not relieve any person of the continuing responsibility to comply with any applicable part of these Regulations or applicable regulations of other relevant extant Regulations.

(3) The issuance of an approval by the Agency does not relieve any person of the responsibility for obtaining any other necessary permits or approvals from any federal, state, regional, or local agency.

(4) The issuance of an approval does not authorize any injury to persons or property or invasion of other private rights, or any infringement of Federal, State or Local Law or Regulations.

(5) Where the works or activities to which the permit relates are carried out by persons other than the permit holder, it is the duty of the permit holder



to take all steps to ensure that the Permit, and any conditions specified in it are complied with by the person carrying out the works or activities.

Records to  
be kept by  
Permit  
Holder.

17.—(1) A person who is, at any time in a month, a permit holder, shall keep record in writing of activities conducted in line with the approval including :

- (a) type of activity ;
- (b) type and composition of discharge made into water body ;
- (c) concentration of discharge made into water body ;
- (d) date, place, co-ordinates and time of discharge ;
- (e) name, contact and address of person in charge of the activity ; and
- (f) any other information as may be specified in the approval.

(2) These records shall be submitted to the Agency periodically as specified in the permit.

Modification,  
Suspension  
or  
Revocation  
of Approval.

18.—(1) The Agency may modify, suspend, or revoke, in whole or in part, an approval for cause, including, but not limited to :

(a) information indicating that the project will likely result in probable harm to the environment or pose a threat to the health, safety and/or welfare of the public ;

(b) the existence of a factor or factors which, if properly and timely brought to the attention of the Agency, would have justified the application of more or less stringent conditions than required by these Regulations, but only if such factor(s) arose after the approval was issued ;

(c) where circumstances on which the approval was based have materially and substantially changed since the approval was issued, including, but not limited to, a change in category of waters from effluent limited to water quality limited, or amendment of these Regulations ;

(d) the information or data submitted by the applicant or permit holder either on the form(s) required or in any other material in support of the application is found to be false, misleading or erroneous ; or

(e) the project is not undertaken in strict compliance with the conditions or provisions of any approval issued by the Agency.

(2) A Notice of Revocation/Suspension of an approval shall be in the form of a letter notifying the permit holder or subsequent transferee of the revocation or suspension and the reasons why the approval is being revoked or suspended.

#### PART B—GROUND WATER QUALITY CONTROL

Purpose.

19. The purpose of these Regulations is to protect groundwater sources by regulating the discharge and underground injection of hazardous wastes,

fluids used for extraction of minerals, fossil fuels energy, and any other substances having the potential to contaminate groundwater.

20.—(1) Classes of Injection Wells shall include :

(a) Class I : Wells used for re-injection of waste :

(i) wells used by generators of hazardous wastes or owners or operators of hazardous waste management facilities to inject fluids beneath the lowermost formation containing, within 500 meters of the well bore, an underground source of drinking water ; or

(ii) other industrial or municipal wells which inject fluids beneath the lowermost formation containing, within 500 meters of the well bore, an underground source of drinking water.

(b) Class II : Wells used to inject fluids :

(i) which are brought to the surface in connection with conventional oil or natural gas production and that may be commingled with wastewater from gas plants as an integral part of production operations, unless those waters are classified as hazardous waste at the time of injection ;

(ii) for enhanced recovery of oil or natural gas ; and

(iii) for storage of hydrocarbons that are liquid at standard temperature and pressure.

(c) Class III : Wells used for extraction of minerals including :

(i) mining of sulfur by the Frasch process ;

(ii) solution mining of minerals ;

(iii) *in situ* combustion of fossil fuel ; and

(iv) *in situ* production of uranium or other metals. This category includes only *in situ* production from ore bodies which have not been conventionally mined. Solution mining of conventional mines (such as stopes leaching) is included in Class V.

(d) Class IV :

(i) wells used by generators of radioactive wastes, by owners or operators of radioactive waste disposal sites, or by any other person to dispose radioactive wastes into a formation which within 400 meters of the well contains an underground source of drinking water.

(ii) radioactive waste disposal wells which inject fluids below the lowermost formation containing an underground source of drinking water within 400 meters of the well bore.

(e) Class V : Injection wells not included in Classes I, II, III, or IV. Class V injection wells are further defined in regulation 25 (2) of these Regulations.

Injection  
Wells,  
Landfills  
and Burrow  
Pits.



(2) *Landfills and Burrow Pits* : Landfills are natural or excavated holes or depressions used for burying waste material or refuse. Borrow pits are large holes that are primarily dug for the purpose of collecting earth materials usually soil, gravel or sand to be used at another location, but could also be used for burying waste material or refuse.

Standards.

21.—(1) Physico-chemical parameters shall be in conformity with Schedule IV to these Regulations, and limits for substances and characteristics affecting the acceptability of ground water source for domestic use shall be in conformity with Schedule V to these regulations.

(2) Pathogenic Organisms and Coliform Bacteria shall not exceed limits as stated in Schedule VI to these Regulations.

(3) All other pollutants shall not be in such concentrations which in the opinion of the Agency would impair the waters for use as a source of potable water or to cause or contribute to a condition in contravention of standards for waters of Nigeria.

Application  
of  
Standards.

22.—(1) Ground Water Discharge Permits. A person shall not make or permit an outlet for the discharge of sewage or industrial waste or other wastes or the effluent therefrom, into any ground water of Nigeria without obtaining a permit from the Agency and the permit shall be issued subject to such conditions as stated in the permitting and licensing system of the Agency.

(2) Applications for ground water discharge permits shall be submitted using the forms prescribed by the Agency and shall contain such information as the Agency may require.

(3) Establishment of Discharge Limits. In regulating discharges of pollutants to ground waters of Nigeria, the Agency shall limit or prohibit such discharges to ensure that the quality standards of the receiving waters is maintained or attained.

(4) The Agency shall determine the applicable level of treatment for an individual discharger and such shall be indicated in the individual ground water discharge permit and in establishing effluent limitations in the individual permits, the Agency shall consider natural background conditions, protect existing adjacent and down gradient uses and shall not interfere with the maintenance and attainment of beneficial uses in adjacent and down gradient waters.

(5) For purposes of determining compliance with sub-regulation 21(3) of these Regulations for toxic pollutants in ground waters, the Agency may adopt the use of Health Advisories.

(6) Coordination with Federal Criteria : The Agency shall use available published water quality criteria documents as guidance in establishing case-by-case discharge limits on specific pollutants to ground waters including but not limited to the Department of Petroleum Resources (DPR)'s Target and Intervention Values and Limits, Nigerian Standards for Drinking Water Quality.

23.—(1) A person shall not inject fluids into or through an injection well and no person shall construct, install, operate or maintain any Class I, II or III injection well, except as authorized under Regulation 20 of these Regulations.

(2) A person shall not construct, install, operate or maintain a Class IV well that is not part of a response action being conducted or performed in compliance with provisions certified by the Agency, or in use for the purpose of remediation at a release site.

(3) A person shall not inject or cause to be injected any fluid into a Class V well where that injection may cause or allow the movement of fluid containing any pollutant into underground sources of water, and the presence of that pollutant causes or is likely to cause a violation of the provisions of these Regulations, or which in the opinion of the Agency adversely affects or may adversely affect the environment and/or health of persons.

(4) Any owner of a cesspool with design flow of 2000m<sup>3</sup>/s or greater that fails to protect public health and environment shall :

- (a) notify the Agency of its intent 30 days prior to upgrade of the cesspool,
- (b) upgrade such cesspool, in accordance with the Agency's requirement.

(5) A person shall not use, construct, install, operate or maintain for the purpose of disposal, a Motor Vehicle Waste well in Nigeria.

(6) A person shall not construct or drill pit latrines, septic tanks and soak away except in accordance with relevant Codes of Practice.

(7) A person shall not construct, install, operate or maintain landfills or borrow pits for the purpose of industrial waste disposal where such wastes may allow pollutants into underground sources of water, and the presence of the pollutant(s) causes or is likely to cause a violation of the provisions of these Regulations, or which in the opinion of the Agency adversely affects or may adversely affect the environment and/or health of persons.

24.—(1) A person shall not sink (drill) a borehole(s) without a drilling permit (license) from relevant authorities except for personal domestic purpose.

(2) All owners of boreholes/wells shall register their boreholes/wells by furnishing such information to relevant authorities.

(3) The license for abstraction of water shall clearly state the following, among others :

- (a) location and coordinates of the borehole ;
- (b) quantity of water to be taken i.e. volume or rate of discharge per day ;
- (c) the intended purpose of the water ;
- (d) the name and address of the licensed abstractor ;



(e) the source of supply e.g name of groundwater strata ;

(f) the means of abstraction e.g borehole or well.

(4) The abstractor/licensee shall keep adequate records of water abstraction rates all through.

(5) The Agency shall in consultation with relevant authorities maintain the power to revoke a right to use a borehole/well or take water when such a right is likely to override public interest.

Authorized  
Activities.

**25.—**(1) Any person may construct, install, operate or maintain a Class IV well in the conduct or performance of a response action in accordance with the method approved by the Agency for the purpose of remediation at a release site.

(2) Any person may construct, install, operate or maintain any of the following Class V wells in compliance with regulation 22 of these Regulations :

(a) wells used to return to the ground the water used for heating or cooling energy in a heat exchanger ;

(b) wells used to return water used for non-contact cooling to the ground provided the temperature is not higher than the mean annual ground surface temperature of the area in question ;

(c) wells used to drain storm runoff into soil bedrock ;

(d) dry wells, seepage pits, and leaching pits used for the injection of waste fluids, other than sanitary waste ;

(e) recharge wells used exclusively to replenish the water in an aquifer with uncontaminated water ;

(f) salt water intrusion barrier wells used to inject uncontaminated water into a fresh water aquifer to prevent the intrusion of salt water into the fresh water ;

(g) on-site subsurface sewage disposal systems in cognizance of the geology of the area ;

(h) subsidence control wells used to inject fluids to reduce or eliminate subsidence associated with the overdraft (over abstraction) of groundwater ;

(i) geothermal disposal wells related to electrical generation and geothermal wells used for heating and aquaculture.

Protection.

**26.** A person shall not conduct any activity that is prohibited by regulation 23 of these Regulations or that which will endanger an aquifer or portion of an aquifer that meets the definition of an underground source of drinking water.

Exemption.

**27.—**(1) The Agency shall exempt an aquifer from being an underground source of drinking water if, after notice and an opportunity for a public hearing, the Agency determines that, the aquifer :

(a) currently does not serve as a source of public drinking water ; and  
 (b) cannot, at present and will not in the future serve as a source of public drinking water because :

- (i) it is used to produce mineral, hydrocarbon or geothermal energy ;
  - (ii) it is so contaminated and with extreme values that endangers human health and would be economically or technologically impractical to render the water fit for human consumption or
- (c) is close to being "mined".

(2) Any injection into a Class IV or Class V injection well during a response action conducted or performed in accordance with method approved by the Agency for the purpose of remediation at a release site, shall be exempted from :

- (a) the prohibitions set forth under regulation 23 of these Regulations ;
- (b) the registration requirements set forth under regulation 28 of these Regulations ;
- (c) the corrective action requirements set forth under Regulation 30 of these Regulations.

28.—(1) Unless exempted pursuant to regulation 27 of these Regulations, each owner or operator of an existing Class V well shall notify the Agency, on a form available from the Agency, of the existence of any well meeting the definitions of Class V within three months after the commencement of these Regulations.

Registration.

(2) Every owner or operator of Class V injection well put into use after 28th Day of April, 2011 shall register that injection well with the Agency.

29. Every owner and operator of an injection well shall make all existing records and information concerning the construction and operation of the well available to the Agency upon request.

Record keeping.

30. Compliance with method approved by the Agency :

(1) Every person performing a remedial activity as part of an injection well closure shall perform such activity in accordance with methods approved by the Agency.

Corrective and Closure action.

(2) Every owner or operator of a well that has been, or at any time may have been the subject of a violation of regulation 23 of these Regulations shall at a minimum :

(a) prevent fluids from entering the injection well until :

- (i) the well is closed and all inlets into the drainage system leading to the injection well are permanently sealed ; or



(ii) the well is authorized by and permitted in accordance with the Groundwater Discharge Permit ; or

(iii) the discharge is connected to a municipal sanitary sewer line ; or

(iv) the discharge is connected to a tight tank provided the connection complies with these Regulations ; or

(v) the discharge is addressed under a plan approved by the Agency.

(b) assess all soil, gravel, sludge, liquids or other materials adjacent to the injection well and all components of the drainage system leading to the injection well ;

(c) remove and dispose of any contaminated soil, gravel, sludge, liquids or other materials adjacent to the injection well and all contaminated components of the drainage system leading to the injection well in accordance with all Federal, State and Local requirements ; and

(d) permanently plug all inlets to the injection well, unless the injection well is closed in accordance with Regulation 30(2)(a) of these Regulations ; and

(e) thirty (30) days prior to closure, submit to the Agency, a Class V Well Pre-Closure Notification Form available from the Agency in compliance with Regulation 23 of these Regulations ; and

(f) within seven (7) days following completion of closure of the injection well, submit to the Agency documentation of closure on a Notification Form available from the Agency ; and

(g) abandoned wells/boreholes/burrow pits pose safety and environmental problems because they act as direct paths for contaminants to reach groundwater and such contaminants may percolate far into the aquifer with time and adversely deteriorate the quality of groundwater within and outside the vicinity of the abandoned well.

(h) all abandoned wells/boreholes/burrow pits shall be decommissioned by a licensed driller/professional with good experience in well construction and decommissioning methods, approved by the Agency, and will take into account the local geology of the area necessary to safely and properly close such well, provide that a notice of intent to decommission a well/borehole/burrow pit shall be required by the Agency at least three (3) days in advance of sealing or decommissioning work.

(3) If the Agency determines that it is likely that there has been movement of injection or formation fluids into underground water or a release or threat of release of oil and/or hazardous material to the environment through an injection well, the Agency shall require any additional closure measures it deems necessary for corrective action and preservation of the underground sources of water.

Monitoring.

31.—(1) The determination of compliance or non-compliance of sewage, industrial waste or other waste discharges with the requirements of these Regulations shall be made through tests or analytical determinations of ground water or effluent samples collected, transported and stored in such a manner as may be approved by the Agency and the location at which ground water samples are collected shall be determined by the Agency provided that in selecting or approving such locations, the Agency shall consider all relevant facts including, but not limited to:

(a) the mobility of pollutants in the unsaturated zone and the pollutant attenuation mechanisms in the zone;

(b) attenuation mechanisms which may remove potential pollutants in passage through the soil;

(c) the relative thickness of the unsaturated zone;

(d) attenuation of pollutant concentrations with distance which may occur in the saturated zone, as a result of attenuation processes occurring below the water table. The location at which effluent samples are collected shall be at a point where the effluent emerges from a treatment works, disposal system, outlet or point source and prior to being discharged to the ground.

(2) The Agency in collaboration with relevant authorities shall determine the number of observation and monitoring wells necessary for the determination of compliance with these Regulations.

(3) Analytical tests to determine compliance or non-compliance with standards shall be made in accordance with methods approved by the Agency.

#### PART C—ENFORCEMENT

32.—(1) Any person may complain to the Agency in writing if such a person considers that an activity(ies) or discharge(s) may jeopardize water uses as stated by these Regulations.

General  
Action on  
water use.

(2) In any such complaint under sub regulation (1) of this regulation, it is not necessary for the complainant to show or prove personal loss or injury or discomfort caused by the activity.

(3) On receiving the complaint, the Agency shall after due investigation and substantiation, take all reasonable steps to ensure that the activity(ies) is controlled in line with these Regulations.

33.—(1) Where the Agency has reasonable cause to believe that any discharge(s) or activity(ies) is likely to violate the provisions of these Regulations, the Agency may serve an improvement notice on that person on a form prescribed by the Agency ordering compliance with these Regulations.

Improvement  
notice.



(2) The improvement notice shall be served on the person alleged or confirmed responsible for the discharge or activity deemed likely to cause the prohibited activity or discharge if the activity or discharge has not yet occurred.

(3) An improvement notice issued under Regulation 33(1) shall specify the period within which the requirements of the notice are to be complied with.

(4) A person on whom an improvement notice is served shall be entitled to demonstrate that such prohibited discharge or activity does not emanate from his facility/premises or actions, and in the absence of which the person shall be bound to carry out the requirements in the improvement notice.

#### PART D—OFFENCES AND PENALTIES

Offences and Penalties.

34.—(1) A person who contravenes or fails to carry out any requirements of the improvement notice commits an offence.

(2) Any person who contravenes any of the provisions of these Regulations commits an offence and shall on conviction be liable to fine not exceeding ₦200,000:00 or for a term of imprisonment not exceeding one year or to both such fine and imprisonment.

(3) Where the offence is committed by a corporate body, it shall on conviction be liable to a fine not below ₦500,000:00, and to an additional fine of ₦10,000:00 for each day the offence subsists.

#### PART E—MISCELLANEOUS

Interpretation.

35. In these Regulations :

“Agency” means National Environmental Standards and Regulations Enforcement Agency (NESREA)

“Applicable Standards and Limitations” means : all state, interstate and federal standards and limitations to which a discharge or activity is subject including but not limited to effluent limitations, water quality standards, standards of performance, toxic effluent standards or prohibitions, best management practices, and pretreatment standards.

“Applicant” means a person who applies for any approval for any discharge, activities, projects, or facilities in accordance with the requirements of these Regulations.

“Application” means all forms, documents, and other information required by the Agency to apply for a permit, order, certificate, or other approval from the Agency in accordance with the requirements of these Regulations.

"Approval" means an authorization, order of approval, permit, certification, license or equivalent determination issued pursuant to Regulations promulgated the Agency.

"Aquatic Research Related Activities" means : an activity in which research is conducted to evaluate the effect of various factors on the health, growth, or reproduction of aquatic organisms.

"Aquifer" means a geological formation, group of formations, or part of a formation that is capable of yielding an economic amount of water to a well or spring.

"Best Management Practices (BMPs)" means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of and impacts upon waters of the nation. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

"Cesspool" means a subsurface pit with open-jointed linings or holes in the bottom and/or sidewalls into which raw sewage is discharged, the liquid portion of the sewage being disposed of by seeping or leaching into the surrounding soils, and the solids or sludge being retained in the pit.

NOTE : Cesspools are nonconforming systems.

"Closure" means the act of securing a facility to prevent it from contaminating an underground source of drinking water, or from otherwise endangering the health of persons or the environment.

"Confined aquifer" means one which is situated between two impervious layers. This renders it closed to recharge in its immediate vicinity which may make recharge to it too slow or even impossible within a reasonable period of time.

"Consolidated Rock or Bed Rock" means any solid hard rock exposed at the surface of the earth or overlain by unconsolidated deposits.

"Cultural Eutrophication" means the human-induced acceleration of primary productivity in a surface water body resulting in nuisance conditions of algal bloom or dense macrophytes.

"DADMax" means daily-day maximum temperatures.

"Designated Uses" means those uses specified in these Regulations for water bodies or segment whether or not they are being attained. In no case shall assimilation or transport of pollutants be considered a designated use.

"Dredging" means the excavation of sediments from beneath surface waters by mechanical or hydraulic means.



*"Degraded"* means a change in water quality from local natural background condition which is determined by the Agency to be deteriorating in terms of the magnitude of the change and the importance of the parameters describing ground water quality.

*"Discharge or Discharge of Pollutants"* means any addition or release of any pollutant or combination of pollutants to waters of Nigeria from any source, including but not limited to, emptying, emitting, pouring, pumping, leaking, placing, depositing, spilling, from surface runoff which is collected or channeled by man; discharges through pipes, sewers, or other conveyances owned by a State, municipality, or other person which do not lead to a personal owned treatment works (POTW) and discharges through pipes, sewers, or other conveyances, leading into privately owned treatment works. This term does not include an addition of pollutants by any indirect discharger.

*"Discharger"* means any person who causes or allows any discharge.

*"Disposal System or On-site System"* means a system or series of systems for the treatment and disposal of sanitary sewage below the ground surface on a facility.

(a) The standard components of a system are: a building sewer; a septic tank to retain solids and scum; a distribution box; a soil absorption system containing effluent distribution lines to distribute and treat septic tank effluent prior to discharge to appropriate subsurface soils; and a reserve area.

(b) These terms also include tight tanks, shared systems, alternative systems and nonconforming systems.

*"DPR"* means: Department of Petroleum Resources.

*"Dry Well"* means a subsurface pit with open-jointed lining or holes through which storm-water drainage from roofs, basement floors, foundations or other areas seeps into the surrounding soil.

*"Effluent"* means discharged pollutant(s) into the environment, whether or not treated.

*"Effluent Limitation"* means Restrictions established by NESREA on quantities, rates and concentrations in water discharge;

*"Effluent Limited Waters"* means any segment of a surface water body where the water quality currently meets or is expected to meet applicable water quality standards after the application of the technology-based effluent limitations required.

*"Effluent Limitation or Effluent Limit"* means any requirement, restriction, or standard imposed by the Agency on quantities, discharge rates, and concentrations of pollutants which are discharged from point sources into waters of Nigeria or to publicly owned treatment works.

*"Existing Ground Water Quality"* means characteristics of the physical, biological, chemical, and radiological parameters representative of the ground water quality at a site at the time of permit issuance, permit renewal or non permitted discharge as determined by an accepted hydrogeologic study.

*"Existing Use"* means those designated uses and any other uses that do not impair the designated uses and that are actually attained in a water body on or after the inception of these Regulations; except that in no case shall assimilation or transport of pollutants be considered an existing use.

*"Exempt Aquifer"* means an aquifer or its portion that has been exempted from regulation 27 in accordance with the procedure thereunder.

*"Facility"* means all contiguous land, and structures, other appurtenances, and improvements on the land used for recycling, reusing, reclaiming, transferring, storing, treating, or disposing of dangerous waste.

*"Filling"* means to place dirt, soil, stones, gravel, sand, sediment, tree stumps, brush, leaves, solid waste, debris, garbage, trash, pollutants, or any other material, substance, or structure, either foreign or related, on or in any waters of the nation or in such a way as to alter the natural character, function or value of any waters of the nation.

*"Fish and Wildlife"* means birds, fish, shellfish, mammals and all other classes of wild aquatic and land organisms and all types of vegetation upon which they are dependent, including all indigenous species.

*"Flow Alteration"* means the change of the normal flow patterns of surface water due to a project which diverts or holds the surface water.

*"Fresh Water"* means water having a chloride concentration equal to or less than 250 mg/l, or a total dissolved solids concentration equal to or less than 10,000 mg/l.

*"Fluid"* means any material or substance that is capable of movement whether in a semisolid, liquid, sludge, gas, or any other physical state.

*"Formation"* means a body of rock characterized by a degree of lithologic homogeneity, which is prevailing, but not necessarily tabular and mappable on the earth's surface or traceable in the subsurface.

*"Formation Fluid"* means fluid present in a formation under natural conditions (as opposed to introduced fluids, such as drilling mud).

*"Groundwater"* means water found underground which partially or completely fills the open spaces between particles of soil and within rock formations.

*"Habitat"* means the area which provides direct support for a given species, population or community. It includes all environmental features that make up an area such as air, water, vegetation, soil, substrate and hydrologic characteristics.



*"Hazardous Waste"* means any waste or combination of wastes that exhibits ignitable, corrosive, reactive, or toxic characteristics and poses a substantial danger, now or in the future, to human, plant or animal life, and which therefore cannot be handled or disposed of without special precautions ;

*"Health Advisory"* means the level of a pollutant in water at which, with a margin of safety, adverse health effects would not be anticipated, as determined by the Agency.

*"Improved Sinkhole"* means a naturally occurring karst depression or other natural crevice found in volcanic terrain and other geologic settings which have been modified by man for the purpose of directing and emplacing fluids into the subsurface.

*"Injection"* means the emplacement of fluids into a formation by gravity or greater pressure through a well.

*"Injection Well"* means a well into which fluids are being introduced.

*"Industrial Waste"* means waste arising from processing and manufacturing industries or trade undertakings and can take the form of liquid, non-liquid, solid and gaseous substances.

*"Lake, Pond or Reservoir"* means any body of water, whether naturally occurring or created in whole or in part, excluding sedimentation control or storm water retention/detention basins.

*"Load Allocation"* means the portion of a receiving water's loading capacity that is attributed either to one of its non-point sources of pollution or to natural background sources.

*"Loading Capacity"* means the maximum amount of loading that surface water can receive without violating water quality standards.

*"Low Quality or Degraded Waters"* means any water whose quality falls below any of the criteria of Parts I and II of these Regulations.

*"Leachate"* means any liquid, including any suspended or dissolved components in the liquid, which has percolated through or drained from a landfill or other solid waste disposal site.

*"Marina"* means

(a) a dock, pier, mooring, wharf, float or combination of such facilities that may accommodate five (5) or more recreational vessels as a commercial operation or in association with a club ; or

(b) any dock, pier, mooring, wharf, float or combination of such facilities used as a commercial operation, aside from (a) above, at which any vessel is serviced or maintained.

*"Marine Toilet"* means any toilet or receptacle for the containment of human wastes located on or within any vessel, as defined herein, not including a portable potty.

"Measurable Change" includes :

- (a) Temperature increase of 0.3°C or greater.
- (b) Dissolved oxygen decrease of 0.2mg/L or greater.
- (c) Bacterial level increase of 2CFU/100mL or greater.
- (d) pH change of 0.1 units or greater.
- (e) turbidity increase of 10 NTU or greater ; or
- (f) Any detectable increase in the concentration of a toxic or radioactive substance.

"Mixing Zone" means a regulatory limited area or volume in the immediate vicinity of a discharge where mixing occurs and the receiving surface water quality is not required to meet applicable standards or criteria provided the minimum conditions described in regulations 4 and 5 of these Regulations are met.

"Milligrams Per Liter or mg/l" means the weight in milligrams of any specific substance or substances contained in one liter of solution.

"Monitoring Well" means a well that is specifically designed, constructed, emplaced and located to measure the impact of a subsurface discharge.

"Motor Vehicle Waste Disposal Well" means a well that receives or has received fluids from vehicular repair or maintenance activities, such as an auto body repair shop, automotive repair shop, new and used car dealerships, specialty repair shop (e.g. transmission and muffler repair shops), or any facility that does vehicular repair work.

"Natural Background Conditions" means all prevailing dynamic environmental conditions in a water body or segment thereof, other than those human-made or human-induced. That is the chemical, physical or biological characteristics of surface or ground waters unaltered by human activity.

"New Discharge" means any discharge which commenced subsequent to inception of these Regulations, unless appropriate approvals had been granted.

"Non-Contact Cooling Water" means water which is used to reduce temperature and does not come into direct contact with any raw material, intermediate product (other than heat), or finished product.

"Non-point Source or "NPS" means any discharge of pollutants that does not meet the definition of Point Source in these Regulations. Such sources are diffuse, and often associated with land-use practices, and carry pollutants to the waters of the nation, including but not limited to, non-channelized land runoff, drainage, atmospheric deposition; precipitation; and seepage.



"*Nutrient*" means a chemical element or compound such as but not limited to nitrogen or phosphorous which is essential to and promotes the growth and development of marine or freshwater plant species.

"*NESREA*" means National Environmental Standards and Regulations Enforcement Agency.

"*Observation Well*" means a well that is used to determine existing hydro geological conditions.

"*Other Wastes*" means all liquid discarded matter other than sewage or industrial waste which may cause or might reasonably be expected to cause pollution of the waters of Nigeria in contravention of adopted standards.

"*Outlet*" means the terminus of a sewer system, or the point of emergence of any wastewater or effluent into the waters of Nigeria or onto the land surface.

"*Owner or Operator*" means the owner/operator of, or agent for any injection well subject to regulation 24.

"*Pathogenic Organism*" means any disease-causing organism.

"*Perched Groundwater*" means unconfined ground water separated from an underlying body of groundwater by an unsaturated zone.

"*Person*" means an individual, public or private corporation, partnership, association, firm, joint stock company, joint venture, trust, estate, state, municipality, commission, political group, state or federal agency, department or instrumentality, special district, interstate body or any legal entity, which is recognized by law as the subject of rights and duties.

"*Point Source*" means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

"*Pollutant*" means any element or property of dredged material, solid waste, incinerator residue, sewage, garbage, sewage sludge, sediment, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, industrial or municipal or agricultural waste or effluent, petroleum or petroleum products, including but not limited to oil; or any material which will likely alter the physical, chemical, biological or radiological characteristics and/or integrity of water.

*"Pollution"* means the human-made or human-induced alteration of the physical, chemical, biological or radiological characteristics and/or integrity of water.

*"POTW"* means personal owned treatment works.

*"Pretreatment Requirements"* means any limitation or prohibition on quantities, quality, rates, and/or concentrations of pollutants directly or indirectly discharged into or otherwise introduced into a treatment works that are imposed by federal or state Regulation or by the treatment works.

*"Public Drinking Water Supply"* means the source of surface/groundwater for a public drinking water supply.

*"Quality Standard"* means the assigned level of purity or quality for any water.

*"Runoff"* means water that drains from an area as surface flow.

*"Sanitary Waste"* means any liquid or solid wastes originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned.

*"Saturated Zone"* means any portion of the earth below the ground surface where every available opening (pore, fissure, joint, or solution cavity) is filled with water.

*"Sewage"* means the water carrying human or animal wastes from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water as may be present.

*"Subsurface Sewage Disposal System"* means a disposal system which discharges sewage onto or beneath the surface of the ground.

*"Soil Absorption System"* means a system of trenches, galleries, chambers, pits, field(s) or bed(s) together with effluent distribution lines and aggregate which is installed in appropriate soils to receive and distribute fluids below the surface of the ground.

*"Seawater or Saltwater"* means those waters of the nation in which the natural level of salinity is equal to or greater than ten (10) parts per thousand, 95 percent or more of the time.

*"Sewage from Vessels"* means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes that are discharged from vessels.

*"Sewage Sludge or Sludge"* means residue, partially solid, or solid, treated or untreated, resulting from the treatment of sewage, including such



*"Nutrient"* means a chemical element or compound such as but not limited to nitrogen or phosphorous which is essential to and promotes the growth and development of marine or freshwater plant species.

*"NESREA"* means National Environmental Standards and Regulations Enforcement Agency.

*"Observation Well"* means a well that is used to determine existing hydro geological conditions.

*"Other Wastes"* means all liquid discarded matter other than sewage or industrial waste which may cause or might reasonably be expected to cause pollution of the waters of Nigeria in contravention of adopted standards.

*"Outlet"* means the terminus of a sewer system, or the point of emergence of any wastewater or effluent into the waters of Nigeria or onto the land surface.

*"Owner or Operator"* means the owner/operator of, or agent for any injection well subject to regulation 24.

*"Pathogenic Organism"* means any disease-causing organism.

*"Perched Groundwater"* means unconfined ground water separated from an underlying body of groundwater by an unsaturated zone.

*"Person"* means an individual, public or private corporation, partnership, association, firm, joint stock company, joint venture, trust, estate, state, municipality, commission, political group, state or federal agency, department or instrumentality, special district, interstate body or any legal entity, which is recognized by law as the subject of rights and duties.

*"Point Source"* means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation or vessel, or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.

*"Pollutant"* means any element or property of dredged material, solid waste, incinerator residue, sewage, garbage, sewage sludge, sediment, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, industrial or municipal or agricultural waste or effluent, petroleum or petroleum products, including but not limited to oil; or any material which will likely alter the physical, chemical, biological or radiological characteristics and/or integrity of water.

"*Pollution*" means the human-made or human-induced alteration of the physical, chemical, biological or radiological characteristics and/or integrity of water.

"*POTW*" means personal owned treatment works.

"*Pretreatment Requirements*" means any limitation or prohibition on quantities, quality, rates, and/or concentrations of pollutants directly or indirectly discharged into or otherwise introduced into a treatment works that are imposed by federal or state Regulation or by the treatment works.

"*Public Drinking Water Supply*" means the source of surface/groundwater for a public drinking water supply.

"*Quality Standard*" means the assigned level of purity or quality for any water.

"*Runoff*" means water that drains from an area as surface flow.

"*Sanitary Waste*" means any liquid or solid wastes originating solely from humans and human activities, such as wastes collected from toilets, showers, wash basins, sinks used for cleaning domestic areas, sinks used for food preparation, clothes washing operations, and sinks or washing machines where food and beverage serving dishes, glasses, and utensils are cleaned.

"*Saturated Zone*" means any portion of the earth below the ground surface where every available opening (pore, fissure, joint, or solution cavity) is filled with water.

"*Sewage*" means the water carrying human or animal wastes from residences, buildings, industrial establishments or other places, together with such ground water infiltration and surface water as may be present.

"*Subsurface Sewage Disposal System*" means a disposal system which discharges sewage onto or beneath the surface of the ground.

"*Soil Absorption System*" means a system of trenches, galleries, chambers, pits, field(s) or bed(s) together with effluent distribution lines and aggregate which is installed in appropriate soils to receive and distribute fluids below the surface of the ground.

"*Seawater or Saltwater*" means those waters of the nation in which the natural level of salinity is equal to or greater than ten (10) parts per thousand, 95 percent or more of the time.

"*Sewage from Vessels*" means human body wastes and the wastes from toilets and other receptacles intended to receive or retain body wastes that are discharged from vessels.

"*Sewage Sludge or Sludge*" means residue, partially solid, or solid, treated or untreated, resulting from the treatment of sewage, including such



residues from the cleaning of sewers, by processes such as settling, flotation, filtration and centrifugation, and does not meet the criteria for a hazardous waste.

"*Sewer*" means a pipe or conduit that conveys wastewater or storm water.

"*Site*" means land or water area on which something is located or is to be located i.e. physical position in relation to the surroundings where any facility or activity is physically located or conducted, including adjacent land used in connection with the facility or activity.

"*Storm Waters*" means precipitation induced runoff.

"*Surface Waters*" means any waters in the country that are not groundwaters.

"*Total Maximum Daily Load*" (TMDL) means the amount of a pollutant that may be discharged into a water body and still maintain water quality standards. The TMDL is the sum of the individual waste load allocations for point sources and the load allocations for non-point sources and natural background conditions taking into account a margin of safety.

"*Tight Tank*" means a tank sealed against leakage of its content.

"*Total Dissolved Solids*" means solids determined using Standard Methods for the Examination of Water and Wastewater, "Total Dissolved Solids Dried at 180°C".

"*Toxic Pollutants*" means those pollutants or combination of pollutants, including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly through food chains, may, on the basis of information available to the Agency, cause death, disease, behavioral abnormalities, cancer, mutations, physiological malfunctions, biochemical abnormalities, including malfunctions in reproduction, or physical deformations, in such organisms or their offspring.

"*Toxic substance*" means a chemical or mixture that may present an unreasonable risk of injury to health or the environment.

"*Treatment Works*" mean to physical, chemical, and biological processes to remove physical, chemical and biological contaminants in any devices, vessels, systems for the storage, treatment, recycling and reclamation. These include but not limited to intercepting sewers, outfall sewers, sewage collection systems, pumping, power, and other equipment, and their appurtenances, extensions, improvements, remodeling, additions, and alterations thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities; and any works, including acquisition of the land that will be an integral part of the treatment

process or is used for ultimate disposal of residues resulting from such treatment.

*"Unconsolidated Deposits"* means all non-indurated or poorly indurated soil materials above the bed rock.

*"Unsaturated Zone"* means that portion of the earth's crust which does not contain sufficient water to fill all interconnected voids or pore spaces. Perched water bodies may exist within the unsaturated zone.

*"Underground Source of Drinking Water (USDW)"* means an aquifer or its portion which supplies any public water supply system; or which contains a sufficient quantity of groundwater to supply a public water supply system; and either currently supplies drinking water for human consumption, or contains less than 3000 mg/l total dissolved solids; and which is not an exempt aquifer.

*"Undesirable" or "Nuisance Species"* means any plant or animal aquatic species which becomes so numerous due to pollutants or physical or hydrological modifications that it interferes with, or indicates an impairment of the designated use(s) of a water body.

*"Vessel"* means any boat or other watercraft whether moved by oars, paddles, sails or other power mechanism, inboard or outboard, or any other boat or structure floating upon the water whether or not capable of self-locomotion, including house boats, floating businesses, barges and similar floating objects.

*"Wasteload Allocation"* means the portion of a receiving water's loading capacity that is allocated to one of its point sources of pollution.

*"Waste Management System"* means strategic approach for effective implementation of a waste handling policy, the elements of which include the principles of inventorization, characterization, segregation, minimization, treatment and disposal.

*"Waste water"* means sewage, industrial waste, other wastes or any combination of the three.

*"Waters of Nigeria"* means all waters within the jurisdiction of Nigeria, including, without limitation, rivers, streams, lakes, ponds, springs, impoundments, estuaries, wetlands, coastal waters, ground waters and trans-boundary waters.

*"Waterbody Segment"* means a defined section or described area which is part of a larger surface water body of the nation.

*"Water mining"* means is a situation where water in a confined aquifer is completely abstracted as if it were a mineral or the extraction of water from a non-replenishing groundwater reserves.



*"Waters of The Nation or The Waters"* means all surface water and groundwater of Nigeria including all tidewaters, territorial seas, wetlands, and land masses partially or wholly submerged in water; and both inter- and intra-state bodies of water which are, have been or will be used in commerce by industry, for the harvesting of fish and shellfish or for recreational purposes.

*"Water Quality Criteria"* means elements of the water quality standards, expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use.

*"Water Quality Limited Waters"* means any segment of a surface water body where the water quality does not meet applicable water quality standards, and is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by any of these Regulations.

*"Water Quality Standards"* means state adopted and NESREA approved ambient standards for water bodies. The standards cover the use of the water body and the water quality criteria which must be met to protect the designated use or uses.

*"Well"* means : a bored, drilled, or driven shaft, a dug hole, or seepage pit whose depth is greater than its largest surface dimension; or, an improved sinkhole; or, a soil absorption system.

*"Well Injection" or "Underground Injection"* means the subsurface emplacement of fluids through a well.

*"WHO"* means World Health Organization.

Citation.

36. These Regulations shall be cited as the National Environmental (Surface and Ground Water Quality Control) Regulations, 2011.

## PART F—SCHEDULES

## SCHEDULE I Regulation 5 (1) (b, e, f and g)

PHYSICO-CHEMICAL AMBIENT WATER QUALITY CRITERIA  
FOR SURFACE WATER

Parameter/ Indicator	Effluent Discharges, Irrigation and Reuse Standards	Fisheries and Recreation Quality Criteria Standards
Ph	6.5-8.5	6.5-8.5
Suspended solids, mg/l	0.75	0.25
Dissolved oxygen, mg/l	Minimum 4.0	Minimum 6.0
BOD <sub>5</sub> , mg/l	6.0	3.0
COD, mg/l	30.0	30.0

SOURCE : African Forum for Utility Regulators.

## SCHEDULE II Regulation 5 (4), (5b) and (6)

CHEMICAL AMBIENT WATER QUALITY CRITERIA FOR  
SURFACE WATER

Parameter/ Indicator (mg/l)	Effluent Discharges, Irrigation and Reuse Standards	Fisheries and Recreation Quality Criteria Standards
NH <sub>4</sub> <sup>+</sup>	2.0	0.05
NO <sub>2</sub> <sup>-</sup>	0.08	0.02
NO <sub>3</sub> <sup>-</sup>	40.0	9.1
Phosphates (as PO <sub>4</sub> <sup>3-</sup> )	3.5	3.5
Cl <sup>-</sup>	350	300
SO <sub>4</sub> <sup>2-</sup>	500	100
Oil and Grease	0.1	0.01
Na <sup>+</sup>	120	120
K <sup>+</sup>	50.0	50.0



Parameter/ Indicator (mg/l)	Effluent Discharges, Irrigation and Reuse Standards	Fisheries and Recreation Quality Criteria Standards
Ca <sup>2+</sup>	180	180
Mg <sup>2+</sup>	40.0	40.0
Total Iron (Fe <sup>2+</sup> /Fe <sup>3+</sup> )	0.5	0.05
Hg	0.0005	0.001
As	0.05	0.05
Pb	0.1	0.01
Cd	0.01	0.005
Cr <sup>6+</sup>	0.5	0.001
Cr <sup>3+</sup>	0.5	0.5
Ni	0.1	0.01
Cu	0.01	0.001
Al	0.2	0.2
Zn	0.2	0.01
CN <sup>-</sup>	0.05	0.001
Phenols	0.25	0.001
Σα/Σβ Radioactivity, Bq/l	0.1 <sup>a</sup> /1.0 <sup>b</sup> Bq/l	0.1 <sup>a</sup> /1.0 <sup>b</sup> Bq/l

SOURCE : African Forum for Utility Regulators and Nigeria Industrial Standards (NIS) 5542:2007 of Standard Organization of Nigeria (SON) 2007.

## SCHEDULE III

Regulation 5 (2) (a)

**BIOLOGICAL AMBIENT WATER QUALITY CRITERIA FOR  
SURFACE WATER**

<i>Parameter/ Indicator</i>	<i>Effluent Discharges, Irrigation and Reuse Standards</i>	<i>Fisheries and Recreation Quality Criteria Standards</i>
Coli index/l	100	50
Coli count (lactose positive)/l	5000	20
Coliphags/l	100	100
Pathogens/l	Must be absent	Must be absent

SOURCE : African Forum for Utility Regulators.

## SCHEDULE IV

Regulation 21 (1)

**TARGET AND INTERVENTION VALUES FOR MICRO  
POLLUTANTS FOR GROUNDWATER**

<i>Substance</i>	<i>Groundwater (Ug/L)</i>	
	<i>Target Value</i>	<i>Intervention Value</i>
<b>1. AROMATIC COMPOUNDS</b>		
Benzene	0.2	30
Ethyl Benzene	0.2	150
Phenol	0.2	2000
Toluene	0.2	1000
Xylene	0.2	70
<b>2. METAL</b>		
Arsenic	10	60
Barium	50	625
Cadmium	0.4	6
Chromium	1	30
Cobalt	20	100
Copper	15	75
Mercury	0.05	0.3
Lead	15	75



Substance	Groundwater (Ug/L)	
	Target Value	Intervention Value
Nickel	15	75
Zinc	65	800
<b>3. CHLORINATED HYDROCARBON</b>		
1,2- dichloro ethane	0.01 (dt)	400
Trihalomethane	0.001 mg/l	
<b>4. POLYCYCLIC AROMATIC HYDROCARBONS (PAHS)</b>		
PAH (Total of 10)*	0.1	70
Naphthalene	0.02	5
Anthracene	0.02	5
Phenantrene	0.005	1
Fluoranthracene	0.2	0.5
Benzo (a) anthracene		
<b>5. OTHER POLLUTANTS</b>		
Mineral oil	50	600

dt = Detection threshold.

\* = Total of 10, include the five listed above and the following: Chrysene, benzo (a) pyrene, benzo(ghi)pyrene, benzo(k) fluoranthene and indeno (1,2,3cd)pyrene Source: DPR.

**LIMIT FOR SUBSTANCES AND CHARACTERISTICS  
AFFECTING THE ACCEPTABILITY OF GROUND WATER FOR  
DOMESTIC USE**

<i>Substances</i>	<i>Highest Desirable Level</i>	<i>Maximum Permissible Level</i>
Total Solids	500mg/l	1,500mg/l
pH Range	7.0-8.5	6.5-9.2
Mineral Oil	0.01mg/l	0.3mg/l
Phenolic Compounds	0.02mg/l	0.002mg/l
Bromide	0.01mg/l	0.1mg/l
Chloride as Cl <sup>-</sup>	200mg/l	600mg/l
Chlorine	<200mg/l	5mg/l
Nitrate	45mg/l	50mg/l
Nitrite	0.5mg/l	2mg/l
Fluoride	0.6-1.5mg/l	1.5mg/l
Copper as Cu <sup>++</sup>	0.05mg/l	1.5mg/l
Iron as Fe <sup>++</sup>	0.1mg/l	1.0mg/l
Zinc as Zn <sup>++</sup>	5.0mg/l	15mg/l
Sulphate as SO <sub>4</sub>	200mg/l	400mg/l
Total Hardness (CaCO <sub>3</sub> )	100mg/l	500mg/l
Calcium as Ca <sup>++</sup>	75mg/l	200mg/l
Magnesium as Mg <sup>++</sup>	30mg/l	150mg/l
Manganese as Mn <sup>++</sup>	0.05mg/l	0.5mg/l
Anionic Detergents	0.2mg/l	1.0mg/l
Colour	5 unit	50 units
Odour	Unobjectionable	Unobjectionable
Taste	Unobjectionable	Unobjectionable

SOURCE : WHO and Department of Petroleum Resources (DPR).



## SCHEDULE VI

Regulation 21 (2)

## MICROBIOLOGICAL LIMITS FOR GROUNDWATER

<i>Parameter</i>	<i>Unit</i>	<i>Maximum Permissible Levels</i>
Total Coliform count	cfu/mL	10
Thermo tolerant Coliform or <i>E.coli</i>	cfu/100mL	0
Faecal streptococcus <i>Clostridium perfringens</i>	cfu/100mL	0
spore	cfu/100mL	0

SOURCE : Nigeria Industrial Standards 5542:2007 of SON 2007.

MADE at Abuja this 28th day of April, 2011.

MR JOHN ODEY  
Honourable Minister  
Federal Ministry of Environment