



WATER QUALITY AND LAB SERVICES FACTSHEET



WATER RESOURCES AUTHORITY

"accounting for every drop!"

A close-up photograph of laboratory glassware. In the foreground, a clear Erlenmeyer flask is partially filled with a vibrant blue liquid. To its right, a graduated cylinder is also filled with the same blue liquid, with its scale visible. The background is softly blurred, showing other glassware and a bright, clean laboratory setting. The overall color palette is dominated by various shades of blue and white.

Accounting for every drop!

WRA'S MANDATE IN WATER RESOURCES PROTECTION AND POLLUTION MANAGEMENT

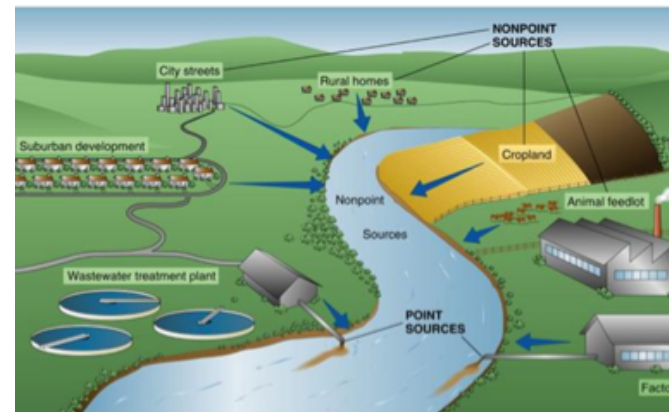
Water is a powerful unique natural resource throughout the world, a source of life, the backbone of growth and prosperity. Unfortunately the world's fresh water resources are under increasing pollution pressure due to unmanaged solid wastes, improper farming practices, inadequately treated industrial and urban set-up liquid waste (effluents) that flow back into our water resources without being satisfactorily treated or reused posing great challenges in water resources management.

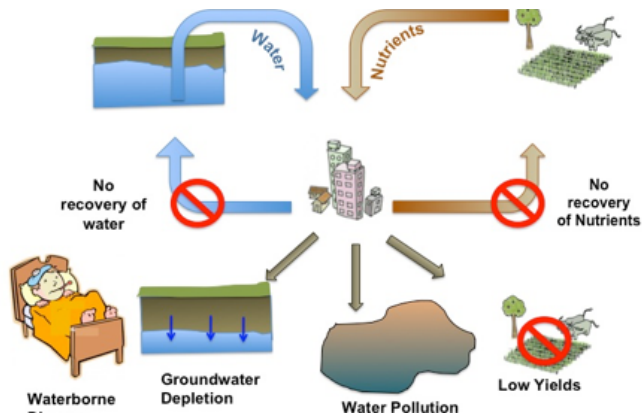
The adverse pollution has a negative ripple effect on the human and environmental health, agriculture, industrial, urban and rural use of water resources sustainably.

The Water Resources Authority (WRA) is a State Corporation established pursuant to Section 11 (1) of the Water Act, 2016. The Authority is the designated agent on behalf of the National Government mandated to regulate the management and use of water resources in equitable and sustainable manner.

What are the sources of pollution?

These are broadly categorized as point (identifiable and specific site) and non-point (unspecific and diffuse site) sources of pollution. The pollutants include: solid, liquid and electronic waste unsatisfactorily disposed into the environment.





How does WRA regulate and protect water resources from adverse effects?

The Authority does this through;

- Established Integrated Water Quality and Pollution monitoring network, formulated Standards and operationalization of the Water Quality and Pollution Analysis Laboratories.
- Requiring facilities to develop, implement and monitoring of Waste Disposal Control Plans (WDCPs)

It is mandatory that all waste disposing and /or discharging facilities should have valid effluent discharge permits issued by WRA and should comply with the conditions attached.



Properly implemented WDCP guarantees clean and safe water being discharged to the receiving water body

WDCP- is a regulatory water resources protection tool that prohibits the disposing and/ or discharging of unsatisfactorily treated solid and liquid waste to the receiving water resources



Lack or improperly implemented WDCP discharges raw effluent into our water resources causing it unsafe, killing the terrestrial and aquatic flora and fauna in the ecosystem.

- Carrying out pollution surveys to establish and map point and non-point sources; develop and implement mitigation measures for protection of water resources from pollution.
- Outreach and attitude change campaigns to sensitize and mobilize stakeholders to action to reduce pollution and illegal dumping of waste into water bodies for improved sanitation.



WRA initiatives for segmented river and riparian land protection involving the community stakeholders

- Initiating Catchment Rehabilitation and Restoration activities aimed at restoring the polluted water resources for enhanced water availability and improved water quality to meet growing water needs and demands.
- Carrying out Water Quality and Pollution assessments and monitoring to establish trends in quality and impacts of management measures taken.



The degraded river bank and riparian land following the floods



The degraded river bank and riparian land after rehabilitation



Monitoring of water quality using Multi parameter

What challenges does the Authority face in the Protection of Water Resources?

- Negative attitude towards waste isolation at the source, containment, conveyance, treatment, disposal, resource recovery and reuse.
- Low levels of safe, practical, scalable, sustainable and innovative solutions for sanitation and waste management.
- Stakeholder's failure to sustainably manage Unintentionally Produced Persistent Organic Pollutants (UPOPs)
- Inadequately treated solid and liquid waste that is illegally disposed and/or discharged from domestic, industrial and agricultural settings.
- Water Service Providers (WSPs) operate dilapidated infrastructure some of which cannot cope with the current volumes of wastewater to be treated.
- Unmanaged solid waste, low sewerage coverage and connectivity especially in the informal settlements; concealed effluent discharges directly to the water resources in the formal settlements and also waste disposal and /or discharge at odd hours (at night and rain time).

- WRA's role in protecting water resources is hampered by un-planned and uncoordinated land use changes, catchment/land degradation, riparian land encroachment and infrastructure constructions with inadequate measures to contain waste and mitigate pollution
 - Pollution and fecal loads are rampant in agricultural areas where fertilizers are excessively used, and in most places which lack proper sanitation. Open defecation contributes to high fecal loads in the surface water resources and shallow wells.
 - Adequate funding needed to develop and implement relevant tools
 - The institutions in charge of solid and liquid waste management failing to perform their roles adequately. Enforcement hampered by hostility from water users and dischargers Court cases are lengthy and costly.
6. Supplying water with domestic permits
 7. Practicing without professional licenses
 8. Dumping soil, effluent, solid waste materials in undesignated areas
 9. Uncontrolled sand harvesting
 10. Discharging untreated effluent to a water body in contravention with Effluent Discharge Control Plans
 11. Failure to irrigate using storage thereby depleting reserve flow/direct abstraction by irrigators instead of irrigation from their storage

Do I also have a role in the protection of water resources?

Yes. In recognizing and appreciating water as a Social and Economic Good, I should comply with Water Resources Regulations for water resources protection, equitable and sustainable water use.

Are there prohibited activities?

Yes, offences are punishable by law. These include:

1. Obstructing /Abstracting water beyond permitted thresholds
2. Irrigating beyond permitted thresholds
3. Illegal drilling without Authorizations from WRA
4. Using water with an Authorization instead of a valid Permit
5. Pumping water from boreholes beyond permitted thresholds

Our Laboratory Services

WRA Laboratories plays a major role in carrying out various Water Quality and Pollution Analytical tests on water to ensure that the water used for various applications meet prescribed guidelines and standards. To ensure that it is within the regulatory requirement, the laboratories offers research and analyses water for:

- Domestic
- Irrigation
- Construction
- Fishing
- Farming
- Recreation
- Wastewater (effluent)

The Constitution of Kenya 2010 establishes the right to safe and clean water for every citizen. The Central Water Testing Laboratories implementing Laboratory Information Management System (LIMS) uses the state of the art equipment and technologies to perform more than 40 different tests on a variety of water samples.



What is Authority's mandate in protection of water resources?

To regulate and protect water resources quality from adverse impacts.

What services are offered in the Laboratory?

- Full Physical - Chemical analysis
- Wastewater (effluent) analysis
- Bacteriological analysis
- Specified analytical parameters of Chemicals for Water Supply Treatment works
- Research

Where are the Laboratories located?

National at Central Water Testing Laboratories; Nairobi, in the Regions and Sub-Regions.

Table 1. WRA Laboratories locations and Contacts

National, Regional & Sub - Regional Laboratories	Laboratory Location	Contacts
National	Central Water Testing Laboratories -, Nairobi	P.O. Box 45250, 00100, Off Dunga Road, Nairobi, Kenya Tel: +254 773903729 Email: cwtl@wra.or.ke; centralwatertestinglabs@gmail.com
Lake Victoria North Basin Region	Kakamega	P.O. Box 774, Kakamega, Kenya Tel: +254 724-831787 Email: lvnba@wra.go.ke; kakamega.region@wra.go.ke
Lake Victoria South Basin Region	Kisumu	P.O. Box 660, 00100, Kisumu, Kenya Email: lvsba@wra.go.ke
Rift Valley Basin Region	Nakuru Naivasha	P.O. Box 1600, Nakuru, Kenya Email: rvba@wra.go.ke; nakuru.region@wra.go.ke P.O. Box 1577, 20117, Naivasha, Kenya Email: naivasha.subregion@wra.go.ke
Athi Basin Region	Machakos	P.O. Box 125, 90100, Machakos, Kenya Tel: +254 718210514,0735101959 Email: athi.region@wra.go.ke

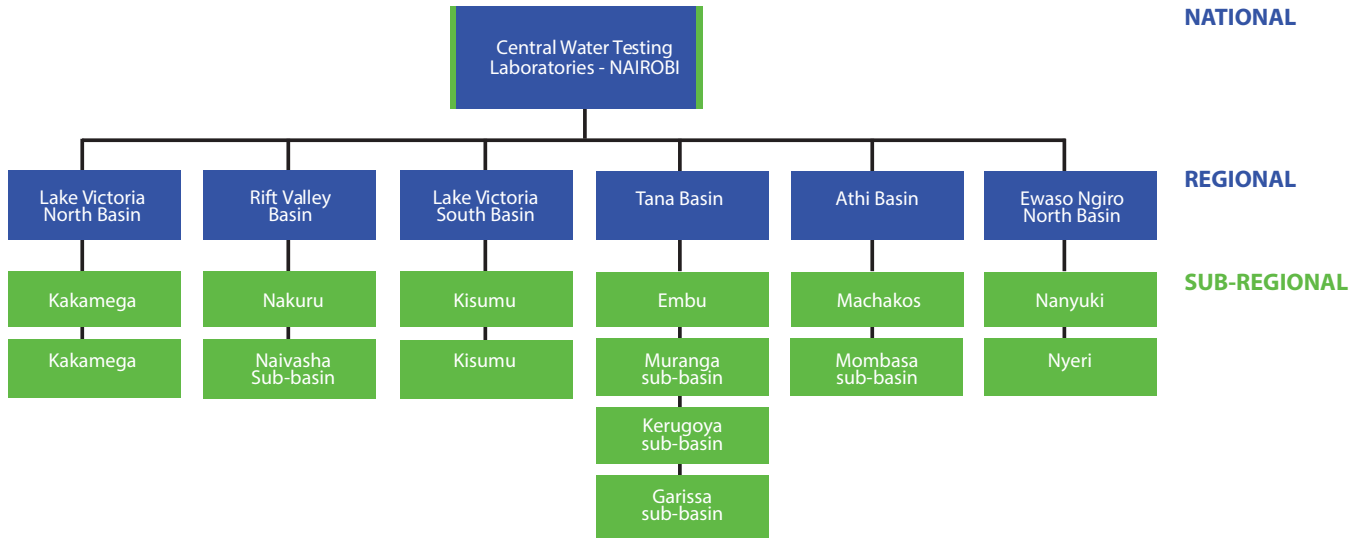
Tana Basin Region	Embu	P.O. Box 1930, 60100, Embu, Kenya Tel: +254 725-989000, Email: embu.region@wra.go.ke
	Muranga	P.O. Box 304, 10200, Murang'a, Kenya Tel: +254 714799476 Email: muranga.subregion@wra.go.ke
	Kerugoya	P.O. Box 1291, 10300, Murang'a, Kenya Tel: +254 723-153469 Email: kerugoya.subregion@wra.go.ke
	Garissa	P.O. Box 31, 10300, Garissa, Kenya Email: Garissa.subregion@wra.go.ke
Ewaso Ng'iro North Basin Region	Nyeri	P.O. Box 1331, 10400, Nanyuki, Kenya Tel: +254 722342212, 062-31784 Email: nanyuki.region@wra.go.ke

What are the costs of lab services offered?

Table 2. Costs of water quality and effluent analysis at WRA Laboratories

S/no	Lab. services	Cost (KShs.)
1	Full Physical -Chemical analysis (Parameter - specific charges allowed)	5,000
2	Wastewater (Effluent) analysis (Parameter - specific charges allowed)	5,000
3	Bacteriological analysis (Parameter - specific charges allowed)	2,000
4	Specified parameters of Chemicals for Water Supply Treatment works	subject to the number of parameters

THE WRA LABORATORIES NETWORK



Who are the Laboratory Customers?

National at Central Water Testing Laboratories; Nairobi, in the Regions and Sub-Regions.

1. Water users
2. Industries
3. Water service providers
4. Government agencies
5. Institutions of higher learning
6. Researchers
7. Agriculturalists



What are the Guidelines and Standards for drinking water?

They provide allowable limits for safe drinking water.

Table 3. Drinking water guidelines and standards

PARAMETERS	UNIT	KS EAS 12:2018 STANDARDS (MAX.)
pH	pH Scale	6,5 – 8.5
Colour	mgPt L -1	15
Turbidity	N.T.U	5
Conductivity (25 0 C)	µS cm -1	1500
Iron	mg L -1	0.3

Manganese	mg L -1	0.1
Calcium	mg L -1	150
Magnesium	mg L -1	100
Sodium	mg L -1	200
Potassium	mg L -1	50
Total Hardness	mgCaCO 3 L -1	300
Total Alkalinity	mgCaCO 3 L -1	500**
Chloride	mg L -1	250
Fluoride	mg L -1	1.5
Nitrate	mg NO 3 - L -1	45
Nitrite	mg NO 2 - -N L -1	0.9
Sulphate	mg L -1	400
Free Carbon Dioxide	mg L -1	-
Total Dissolved Solids	mg L -1	1000
Total Coliforms	MPN 100 mL -1	Not detectable
E. Coli	MPN 100 mL -1	Not detectable
Legionella ssp	CFU 100 mL -1	Not detectable
Free residual chlorine	mg L -1	0.2-0.5

WHAT ARE THE EFFLUENT DISCHARGE STANDARDS?

The allowable limits of effluent discharge into the public sewer and environment for protection of water resources and ecosystems.

Table 4: Effluent discharge standards into public sewer and environment

PARAMETERS	UNIT	EFFLUENT DISCHARGE STANDARDS (Max)	
		ENVIRONMENT	PUBLIC SEWER
Temperature	o C	±3 ambient temp.	20-30
pH	pH Scale	6.5-8.5	6-9
Conductivity	µS cm -1	-	-
BOD 5 (20 0 C)	mgO 2 L -1	30	500
COD	mgO 2 L -1	50	1000
Total Alkalinity	mgCaCO 3 L -1	-	-
Total Suspended Solids	mg L -1	30	250
Total Dissolved Solids	mg L -1	1200	2000

Sulfides	mg S 2- L -1	0.1	2
Oil + Grease	mg L -1	Nil/Absent	5 or 10
Colour	mgPt L -1	15	40
Total Nitrogen	mg N L -1	2 guideline values	
Total phosphorus	mg P L -1	2 guideline values	
Total coliforms	MPN 100 mL -1	30	-
E. Coli	MPN 100 mL -1	Nil/Absent	-
Heavy Metals	mg L -1		
Chromium, Cr	mg L -1	0.05	0.05
Lead, Pb	mg L -1	0.01	1
Cadmium, Cd	mg L -1	0.01	0.5
Zinc, Zn	µg L -1	0.5	5
Arsenic, As		0.02	0.02

Laboratory services achievements

- Establishment and operationalization of National, Regional and Sub-Regional laboratories.
- Trilateral collaboration for water resources protection, water quality and pollution monitoring; Israel (MASHAV), Kenya (WRA) and Germany (GIZ).
- Upgrading of equipment for Isotope analysis technologies.
- Implementation of Laboratory Information Management Systems (LIMS).
- Research and trainings.

Why you need our laboratory services

- Improved Water Resources Information Knowledge base.
- Public Health and Safety.
- Protection of water resources quality from adverse impact.
- Integrated approach in environmental health for sustainable and better ecosystems.





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