

Aqualia-LAB

ANNUAL ACTIVITY REPORT 2024

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Aqualia-LAB: Essential for water quality

Water analysis laboratories play a crucial role within end-to-end water cycle management systems. Their primary mission is to ensure that water complies with **current regulations and quality standards to protect public health and the environment**. This involves using validated and accredited methodologies to accurately and traceably assess the presence of physical, chemical, and microbiological contaminants.

The operation of a water analysis laboratory is based on a highly specialised structure that includes representative sampling, appropriate transport and preservation of

samples, analysis, and the rigorous treatment and reporting of results. These processes are supported by high-tech equipment, qualified personnel, and robust quality systems.

The role of laboratories is not only analytical but also strategic, as they contribute to the continuous improvement of water management services in various municipalities. They also help prevent health risks, ensure legal compliance, innovate in water treatment, and promote resource sustainability.

KEY ACHIEVEMENTS IN 2024



Highly satisfactory results in **external and internal audits**, confirming high levels of technical and organisational compliance.



Development and implementation of **new analytical methods**, effectively managing the increase in sample volume and parameters analysed.



Installation of advanced equipment, along with training of technical staff for its proper use and application.



Participation in validation **exercises for new analytical methods**, reinforcing the technical position of the laboratories in the sector.

This report reflects the work carried out by Aqualia's accredited laboratories in 2024, **a network of 22 accredited laboratories and two in the process of accreditation**, distributed across five countries:

The main function of these laboratories is to conduct quality control analyses of water for human consumption, while also analysing of inland, wastewater, swimming pool, and marine water.

The laboratories are accredited under **ISO 17025**, thus providing the utmost assurance and reliability in terms of technical expertise in carrying out these analyses.

Colombia

Two laboratories in the process of accrediting **24** parameters between them.

Spain

eight accredited laboratories in Vigo, Tafalla, Oviedo, Badajoz, Adeje (Tenerife), Jerez de la Frontera, Lleida, and Ávila; the latter six are managed under the HIDROTEC brand and have a total of

64 staff analysing
1,034,387 parameters in
66,175 samples.

A total of **1,170** parameters are accredited across these laboratories.

7 Czech Republic

8
Spain

1
Italy

6
Georgia

2
Colombia

Italy

one accredited laboratory employing

3 people and analysing
19,300 parameters across
1,120 samples.

In total, **17** parameters are accredited at the laboratory.

Georgia

six accredited laboratories, employing

57 people, where
233,831 parameters are
analysed across
17,854 samples.

In total, **149** parameters are accredited among the six laboratories.

Czech Republic

seven accredited laboratories with

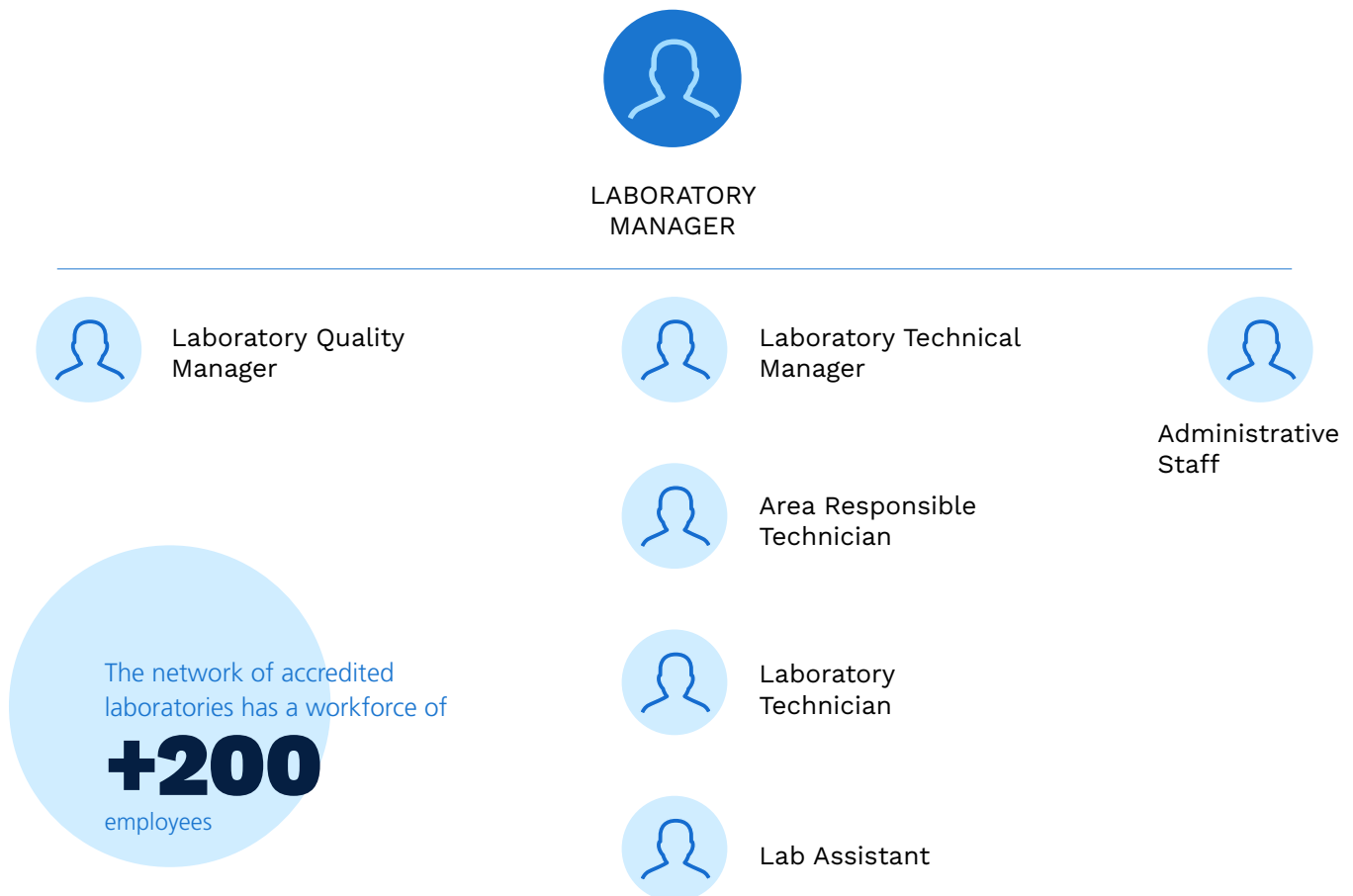
97 people and analysing
221,000 parameters.

In total, **28** parameters are accredited among these seven laboratories.

Organisation and structure of the laboratories

Organisational Structure

The organisational structure of Aqualia's accredited laboratories is generally similar across all of them, with the following organisational chart:



As part of the commitment to training and talent development, Aqualia's laboratories actively collaborate with various institutions and universities. These collaborations involve hosting a significant number of interns who integrate into real work teams and participate in analytical activities under supervision. This training effort strengthens the sector and attracts highly qualified future professionals.

The Aqualia laboratory team is characterised by a **high level of technical qualification** in all areas of analysis, supported by experience and continuous training. Most staff hold higher education degrees, reinforcing the technical competence of the network and ensuring the reliability and rigour of the analytical results issued.

Additionally, the **inclusion of people with disabilities** in our work areas is a priority for the laboratories. We have established collaborations with specialised entities and institutions that facilitate both job integration and individualised follow-up of each case. The laboratories adapt workstations and procedures so that these individuals can perform real, useful functions fully integrated into the regular workflow. This commitment requires joint effort from both the collaborating entities and the laboratory's technical team, resulting in more diverse, inclusive, and enriching work environments for the entire organisation.

Training programmes

Our laboratories implement continuous training programmes for all technical staff to ensure constant updates in analytical procedures and compliance with the highest quality standards.

These initiatives cover both **updates in testing methods and the incorporation of new techniques and technologies**, allowing our professionals to stay at the forefront of analysing various evaluated parameters. This ensures maximum technical competence and rigorous application of accredited procedures, strengthening our commitment to excellence.

Work areas and equipment used

To carry out the analysis chain in a coordinated and organised manner, the laboratories distribute their work areas as follows: chromatography area, physicochemical analysis area, microbiology area, and radioactivity area.

The laboratories are equipped with a wide range of modern equipment. Some notable equipment, by area, includes:



Chromatography area

Highly specialised equipment for the separation and detection of organic and inorganic compounds in different matrices, including:

- Gas chromatograph with triple quadrupole mass spectrometry detection and Twister thermal desorption system (GC-TQ).
- UPLC liquid chromatograph with mass detection (UPLC-MS).
- Ion chromatograph with ultrafiltration and conductivity detector (IC).



Physicochemical analysis area

Dedicated to determining fundamental parameters for evaluating water quality in various contexts, including:

- Inductively coupled plasma mass spectrometer (ICP-MS).
- Equipment for determining TOC by catalytic combustion (TOC).
- Atomic fluorescence spectrophotometer for mercury determination (AF).

Microbiology area

Specialised in detecting and quantifying indicator microorganisms of contamination using traditional and rapid methods, including:

- High thermal stability incubation ovens for microbiological cultures.
- Automated culture medium preparation and dispensing equipment.
- Microscope with epifluorescence module.



Radioactivity area

Dedicated to determining natural or artificial radioactivity in samples, including:

- Proportional counters for alpha and beta activity determination (PC).
- Scintillation counter for radon and tritium determination (SC).



Audits and new accreditations obtained

To ensure compliance with the **requirements of ISO/IEC 17025**, Aqualia's laboratories are regularly subjected to external audits by nationally and internationally recognised accrediting entities. These audits are conducted by independent technical experts who evaluate both the analytical methods and the management systems implemented.

In addition to external audits, each laboratory conducts internal audits by qualified internal auditors to ensure proper preparation and compliance with established requirements.

During the 2022–2024 period, a complete cycle of external and internal audits was completed in various laboratories within the network. This period included

follow-up, re-evaluation, and scope expansion audits, both in terms of accredited parameters and analysed matrices.

New parameters have also been added to the accreditation scopes, including drinking water, inland waters, swimming pool waters, and wastewater. These expansions reflect the laboratories' commitment to continuous improvement, expanding technical capabilities, and responding to new regulatory and analytical requirements.

Currently, new accreditation scope expansion processes are underway in several laboratories within the international network, aiming to incorporate over 200 additional parameters in various matrices during 2025.

Projects and activities undertaken

Participation in networks and collaborations

Participation in interlaboratory exercises

To ensure technical competence and reinforce the reliability of analytical results, the laboratories actively participate in intercomparison exercises promoted by external entities. These exercises involve analysing blind samples distributed by national and international organisations, allowing the evaluation of analytical performance under controlled and comparable conditions.

In 2024, there was consistent participation in intercomparison rounds for both physicochemical and microbiological parameters. The results showed high levels of conformity, exceeding 90 % compliance in physicochemical parameters and 80 % in microbiological parameters. In cases where non-conforming results were detected, corrective actions were applied, and the exercise was repeated to ensure all parameters are supported by validated and verified results.



Collaborations

The laboratories maintain collaboration agreements with educational institutions at various levels—vocational training, universities, and specialised centres—to host students for internships. This collaboration allows students to integrate into laboratory teams and gain practical experience in a real technical environment.

We also promote social initiatives aimed at the job integration of people with disabilities and adapt our workspaces accordingly. These actions are supported by collaborating entities and represent a firm commitment to inclusion, diversity, and the creation of accessible work environments.

Scientific or technical networks

Institutional participation

The laboratories are part of various technical, scientific, and sectoral networks at national and international levels. Through specialised working groups, they actively contribute to the development and review of technical guidelines, methodological criteria, and common tools for improving the operation of water testing laboratories.

Participation in these networks allows us to exchange knowledge, harmonise criteria, and adapt to new regulatory requirements, positioning the laboratories as active players in the development of the water analysis sector.

Collaboration with R&D+i projects and technological platforms

As part of their commitment to innovation, the laboratories participate in applied research projects and technological platforms focused on detecting, controlling, and monitoring emerging contaminants and pathogens.

A notable example is the European NINFA project, aimed at preventing groundwater contamination and developing advanced analytical methods for monitoring substances of concern. Collaboration also extends to the SENTIATECH technological platform, focused on early detection and control of chemical and biological risks, including microplastics, nanoparticles, and other emerging contaminants.

Technological innovations and improvements

Implementation of new technologies

In 2024, we implemented new technologies and developed advanced analytical methods in various technical areas. These advancements enable the laboratories to meet new regulatory requirements and improve their ability to detect contaminants in both conventional matrices and those of greater complexity.

Among these innovations is the validation of methods for detecting indicator viruses such as somatic coliphages, as well as participation in international equivalence exercises to demonstrate the reliability of these new methods compared to established procedures.

Additionally, methods have been developed for the determination of new parameters using:

- Gas chromatography with mass detection, employing pre-extraction techniques such as purge and trap.
- Liquid chromatography with mass detection.



Challenges and opportunities



Challenges faced during the year

One of the main challenges addressed by the laboratories in 2024 **was adapting to new regulatory and operational frameworks related to water quality**, which involved a significant increase in the volume of samples, parameters analysed, and control processes.

This increase required logistical optimisation, reinforcement of technical training, adaptation of procedures, and acquisition of specialised equipment, with substantial investments to maintain quality standards, traceability, and reliability of results.

Other actions

In parallel, the laboratories have advanced in their digital transformation processes, with the evolution of analytical management tools that enable greater traceability, process automation, and efficiency in result processing. These tools are being progressively adapted to laboratories in different regions and technical realities within the laboratory network.

Opportunities identified for the future

With a consolidated and expanding network of laboratories, there are opportunities to strengthen international collaboration, share knowledge, and establish synergies between technical teams from different countries. The creation of an integrated and global network of laboratories will allow for the advancement in the homogenisation of technical criteria, the joint development of innovative methodologies, and the optimisation of resources.

In the digital realm, laboratories play a key role in the development of shared platforms for the processing of analytical data, as well as in interoperability with external entities, institutional platforms, and environmental quality control systems.

Finally, the social integration will continue to be reinforced through the hiring of people with disabilities, adapting environments, tasks, and processes to facilitate their professional development. This line of action will remain a reference within the sustainability and inclusion model of the laboratory network.



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