

Case Study

# AQUABIO: SOLE SUPPLIER TO MEKOROT, ISRAEL'S NATIONAL WATER COMPANY, FOR THE CONTINUOUS AND AUTOMATIC MONITORING OF MICROBIOLOGICAL PARAMETERS

## CHALLENGE

Israel faces **major challenges related to water scarcity and drought** due to its arid climate and scarcity of water resources:

- Approximately 60% of Israel's land area is desert, and the rest is semi-arid, limiting natural water sources.
- More than 70% of Israel's **drinking water comes from desalination plants**, converting seawater into drinking water through advanced processes.
- Israel **leads in wastewater treatment and reuse**, with about 90% of wastewater treated and reused, mainly in agriculture.
- In 2023, Israel experienced its driest winter in 60 years, with rainfall that was half of normal, raising the risk of drought.

These data reflect the complexity of water management in Israel and the surrounding region, where **water scarcity and technological innovations play a crucial role** in sustainability and access to drinking water.



*aquaBio B503*

Mekorot is Israel's national water company and plays a crucial role in Israel's water security.
It is responsible for managing and operating the water supply system in the country, whose mission is to ensure the supply of high quality drinking water for the Israeli population and industries, as well as water resource management and water treatment.
**Monitoring and controlling the quality of drinking water is essential** for the maintenance of public health.

In Israel, this control **is performed by Mekorot**, in accordance with the Ministry of Health standards specified in the Public Health Regulations.

The methods currently used to monitor microbial contamination in **water are classical standard methods**, such as MPN (most probable number) and membrane filtration (MF).

These methods **provide results within 24-48 hours** from the time of sampling, which makes risk assessment and timely treatment of contaminations difficult.

To reduce response times, Mekorot invests numerous resources in improving its monitoring system.

It is in this context that **Mekorot has initiated a project for the evaluation of different technologies** available on the market for the determination of microbiological indicators.

**Between 2018 until 2020, it has evaluated 6 different technologies**, including Adasa's automatic and continuous microbiological measuring device **aquaBio**, at **water treatment plants in the Jordan Valley area and the northern region**.

The aim has been to prevent the entry of bacteria into the supply system, protect the water catchment areas and ensure future drinking water safety measures.

# ADASA'S SOLUTION

Mekorot has carried out a public tender for the supply of an **advanced system for the automatic monitoring of the drinking water supply with online microbiological sensors** in which different equipment has been evaluated.

For the Israeli water utility, the **use of automatic and continuously improved methods enables real-time detection** of the presence of dangerous pathogens.

Adasa has presented the **aquaBio** device, designed, manufactured and developed in-house, for automatic, in-line and continuous microbiological measurement.

**aquaBio** automatically determines the presence of *E. coli* and total coliforms in water.

Mekorot has carried out a **process of verification of the reliability of the results compared to the laboratory** method and its effectiveness and robustness in the field of **aquaBio**.

The detection and quantification capability of the different devices for *E. coli* and total coliforms, their detection limit, the quality of the measurement in different water sources and their continuous operation in the field were evaluated in the following stages:

- **First stage**: verify the detection limit of the device.
- **Second stage**: test the effect of different types of water on the quality of the measurement.
- **Third stage**: placing the device in the field.

The results show that the **aquaBio**:

- is sensitive to bacterial concentrations in the unit range, meeting Mekorot standards,
- there are slight differences in the measurements according to the water sources, although they are not significant and can be corrected for each type of water.
- is robust and easy to use, as evidenced by its operation in the field.

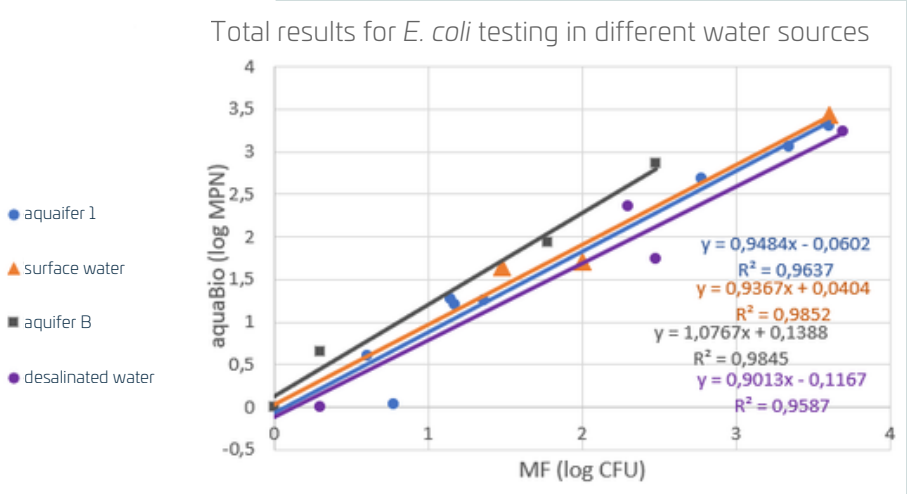
The method used in **aquaBio** is **aligned with the standard protocols of the Standard Methods for the Examination of Water and Wastewater** (APHA, AWWA, WEF), specifically following the 9223B standard.

**aquaBio**

In addition to the internal validation performed at Mekorot, **aquaBio** has ETV (Environmental Technology Verification) verification, which guarantees the issuance of reliable and trustworthy data accredited by an independent body.

In this way, decisions derived from monitoring with **aquaBio** can be made with complete confidence.
It provides a result within 3 hours for high concentrations and within 12 hours ensures the total absence of bacteria.

The measuring principle is based on DST® technology (defined substrate technology) and a detection system to measure fluorescence and absorbance.
Color and fluorescence appear as soon as the specific substrate is metabolized.




*Results of E. coli measurements between aquaBio and Mekorot's laboratory for each of the water sources tested.*

## RESULT

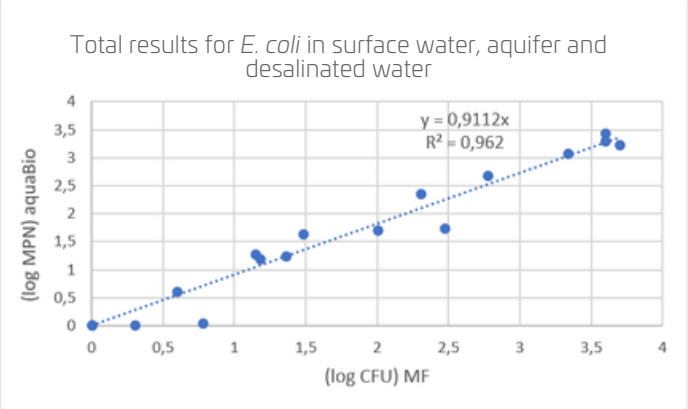
Mekorot's report claims that the **aquaBio** analyzer, capable of meeting the requirements for drinking water, offering fast and accurate detection of microbiological contamination.

According to Mekorot, Adasa's advanced **aquaBio** technology allows not only the continuous detection of pathogens, but also the highly accurate quantification of *E. coli*, eliminating the need for time-consuming manual analysis.

In this way, the Israeli water utility can react immediately to any potential threat to public health.

The end result has been that Mekorot has approved the **aquaBio** device as a unique continuous monitoring technology for the measurement of *E. coli* and total coliforms.

Consequently, it has proceeded to purchase Adasa's automatic **aquaBio** systems for early warning of microbial contamination in the drinking water system.




## CLIENT

Mekorot is a state-owned company under the responsibility of the Ministry of Infrastructure, Energy and Water.
The company is engaged in water management, production and supply, wastewater recycling, brackish water desalination and more.

Mekorot currently supplies about 80% of the drinking water and approximately 70% of the water consumed in Israel.

In addition, it is responsible for the treatment of 42% of the wastewater in Israel (180 million cubic meters per year out of a total of 430 million cubic meters treated annually) in 8 facilities of various sizes, and manages approximately 60% of the treated wastewater for agriculture.

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