



## Case Study

# How EZ Analysers Create Peace of Mind for Monitoring Drinking Water Production



### Objective

Process monitoring & regulatory compliance

### Parameters

- Ammonium
- Total Aluminium
- Total Manganese

### Solution

- EZ1102 Ammonium
- EZ2000 Total Aluminium
- EZ2003 Total Manganese

### Problem

A drinking water company in UK requires validated instruments for monitoring of final drinking water before distribution.

Working with the Water Company operations and scientific personnel, Hach® has been running trials of 3 EZ Analysers over a year-long period, taking into account seasonal and water quality changes for the duration of the trial. According to the customers validation protocol, the following trial criteria were defined at the start:

- History of the Instrument measurements by logging the output and with the addition of frequent sampling and bench analysis to give confidence in the efficacy of the online instrument readings.
- Site Logs to show if and when operational changes – shutdown, dosing changes, flow adjustments occur and the efficiency of the units to these changes.
- How the instruments react to power failure, shutdown and restart. How do they react to change in any measurement parameter.



## Solution

The Ammonium unit is part of Hach's EZ1000/2000 range of on-line colorimeter range for water parameters. It can measure either by the Berthelot or Nessler Method.

The flexible analyser mainframe allows a perfect on-line duplicate of any standard or laboratory wet-chemical method in a compact footprint. Featuring automatic and highly precise colorimetric measurements and standard smart automatic features (cleaning / calibration). Standard 4 – 20 mA output with alarm processing (Modbus). Higher measuring ranges by internal dilution. Multiple stream analysers as an option.

The Total Aluminium and Total Manganese units are part of the Hach EZ2000 Range.

Total Aluminium and Total Manganese Analysers achieve excellent precision and accuracy. At the heart of the colorimeter there is a compact photometer assembly developed especially for the EZ Series. Consumption of reagents is reduced by low volume analysis, yet high sensitivity is assured by a long optical path length. The limit of detection is in the low µg/L range. EZ2000 Total Aluminium and Total Manganese Analysers have an internal digestion unit. This additional step prior to analysis allows the measurement of non-soluble or complexed metal species.

## Benefits

Hach continues to support their clients to meet monitoring requirements whilst increasing operability, reducing inaccuracies and mitigating risk. The EZ series analyser is an effective tool to meet online monitoring challenges and we look forward to seeing our clients continue to manage their monitoring requirements using this analyser.

## Details

During the first 9 months, samples were collected daily, with logs and results documented by Hach personnel on-site. The Ammonia, Total Aluminium, and Total Manganese analysers each use different sets of chemicals, which require regular changing (every 23–28 days). Replenishing involves shutting down the unit, changing bottles, priming for 3 minutes, and restarting. Auto-calibration is available, and staff are trained by Hach on operational and maintenance procedures.

### Analysers Overview

- Ammonium Analyser (EZ1102): Monitors after chloramination using Berthelot colorimetric method. Records results every 18 minutes and can store up to 1000 readings. It connects to SCADA and alerts operators if set levels are exceeded. The plant averages 4 shutdowns/week for maintenance, and the analyser adapts quickly to restart.
- Total Aluminium Analyser (EZ2000): Uses four chemicals and records results every 22 minutes. Data is downloadable via USB. It's connected to SCADA and triggers plant shutdown if alarms are met. Results are checked three times a week by staff using Palintest spectrophotometers.
- Total Manganese Analyser (EZ2003): Initially faced calibration and SCADA connectivity issues, fully operational since October 2021. Records results every 21 minutes and stores 1000 readings. Results are checked weekly with DR1900 Spectrophotometer and LCW532 reagents.

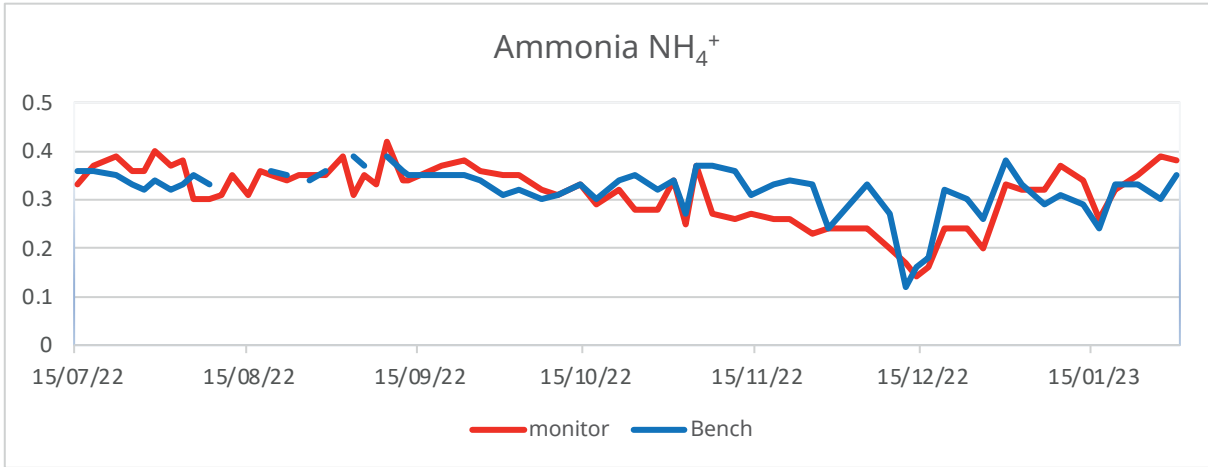
### Sample Collection & Analysis

- Ammonia: Target range is 0.12–0.48 mg/L. Bench samples are analysed with a Hach DR3900 Spectrophotometer using LCK304 reagents.
- Total Aluminium: Target range is 0.1–0.15 mg/L. Bench samples are analysed with portable Palintest spectrophotometers.
- Total Manganese: Target range is 0.4–0.45 mg/L. Bench samples are analysed using DR2800 Spectrophotometer with LCW532 reagents.

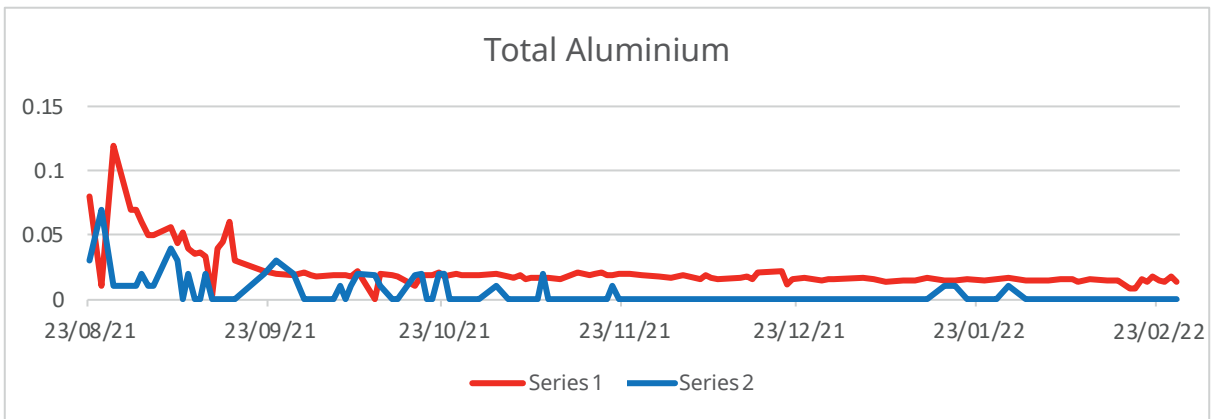
**Results and Data**

Graphs included show comparisons between analyser and bench results over the trial period, with snapshots of database readings.

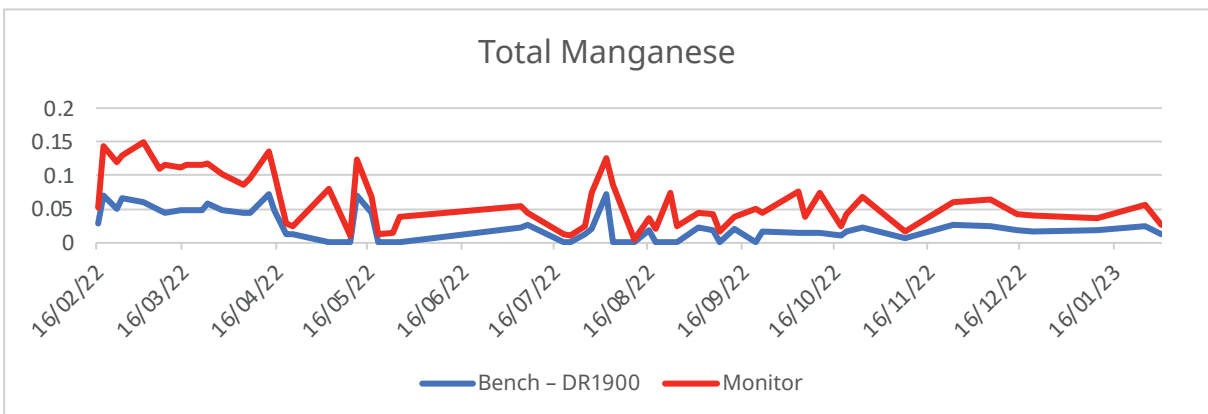
**Graph 1 - Monitor results vs lab Results: Ammonia**



**Graph 2 - Monitor results vs lab Results: Aluminium**



**Graph 3 - Monitor results vs lab Results: Manganese**



## Conclusion

The three trials have run over a period of 18 months to allow seasonal effects and changes in water quality over time.

Results from all 3 Analysers show consistent results in line with bench analysis.

The Operations Teams of the Water Company were fully satisfied with the units, their performance and Hach's response times if any operational issues occurred. The teams have been fully trained on all the operational and maintenance aspects of the analysers, and they are now connected to the Water Company's SCADA systems along with the required alarm settings.

